INTEGRATED **WILDLAND FIRE** MANAGEMENT PLAN

Oahu & Pohakuloa Training Areas

25th Infantry Division (Light)
and
United States Army, Hawaii

October 2003

Integrated Wildland Fire Management Plan

Pohakuloa and Oahu Training Areas

United States Army, Hawaii and 25th Infantry Division (Light)

Prepared by

Center for Environmental Management of Military Lands
Colorado State University
Fort Collins, Colorado

And

Installation Fire and Safety Office
United States Army, Hawaii

October 2003

DEPARTMENT OF THE ARMY
HEADQUARTERS, 25TH INFANTRY DIVISION (LIGHT) AND U.S. ARMY, HAWAII
SCHOFIELD BARRACKS, HAWAII 96857-6000

REPLY TO
ATTENTION OF
APVG-CG

1 DEC 2003

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Policy Memorandum USAG-HI-9, Wildfire Management Program

1. References.

a. Army Wildland Fire Policy Guidance, Sep 02.

b. 25th ID(L) & USARHAW, Integrated Wildland Fire Management Plan, Pohakuloa and Oahu Training Areas, Mar 00 (enclosed).

c. AR 200-3, Natural Resources- Land, Forest and Wildlife Management, Feb 95.

d. AR 200-4, Cultural Resources Management, Oct 98.

e. AR 350-4, Integrated Training Area Management, May 98.

f. AR 420-90, Facilities Engineering, Fire Protection Program, Sep 97.

g. DODI 6055.6, Department of Defense Fire & Emergency Services Program, Oct 00.

h. Review and Update of the 1995 Federal Wildland Fire Management Policy, Jan 01.

i. National Wildfire Coordinating Group, Wildland and Prescribed Fire Qualification System Guide (PMS 310-1/NFES 1414), Jan 00.

j. National Fire Protection Association, Standard 295- Standard for Wildfire Control, Aug 98; Standard 1144- Protection of Life and Property From Wildfire, Jul 02; Standard 1051- Wildland Firefighter Professional Qualification Standard, Jan 02.

2. Applicability.

a. This policy applies to all soldiers and civilians of the 25th Infantry Division (Light) and United States Army, Hawaii (25th ID(L) & USARHAW), and to all military services and other personnel using the Army ranges and training lands under its jurisdiction. The provisions of this policy are conditioned on the conclusions and recommendations arising out of analyses pending under the National Environmental Policy Act, the National Historic Preservation Act, and the Endangered Species Act.

b. Maintaining combat readiness in Hawaii requires access to training lands. The Hawaiian Islands provide the Army a strategic Pacific location, and require some very special land management, as well. Hawaii is home to some of the most unique natural and cultural resources in the country. The 25th ID(L) & USARHAW must live up to the stewardship requirements in order to continue use of these sensitive lands for training. Federal and state laws protect many of these resources. In order for us to meet our stewardship requirements, and to comply with applicable laws, the 25th ID(L) & USARHAW

must manage and prevent wildland fires or wildfires. Wildfires are also a threat to human life and property. The best way to protect human life, property, and natural and cultural resources, is through involved leadership, prevention, education, training, and management. As the senior officer responsible for the retention of Army lands in Hawaii, I expect every commander, director, and individual within my Command to support, comply, and enforce this policy on wildfire management.

3. Policy.

a. This policy establishes a 25th ID(L) & USARHAW Wildfire Management Program in accordance with the Army Wildland Fire Policy Guidance, and provides the guidance and direction to develop the Integrated Wildland Fire Management Plan (IWFMP). The IWFMP is designed to aid land managers, natural/cultural resource managers, and wildfire managers in the planning and programming of resources.

b. The success of this program depends on commanders and directors ensuring that these policies are actively implemented to make the program work on the ground. The following categories were developed to meet the purpose of the program:

(1) Safety. Public and firefighter safety is the first priority in every fire management activity. The reduction of potential loss of human life is a primary consideration in fire management. Fire suppression is a risky endeavor and sound risk management is a foundation for all fire management activities.

(2) Planning. The IWFMP has been developed for land managers as a management tool to address pre-suppression, suppression, post-fire and other wildland fire management issues.

(3) Prescribed Fire. Prescribed fire will be considered as a viable tool to manage fuels and will be utilized under environmentally appropriate conditions, as defined by prescribed fire specifications.

(4) Preparedness. Fire managers will ensure their capability for providing safe, effective fire management in support of this program and the IWFMP.

(5) Suppression. Fires are suppressed at minimum cost, while considering public and firefighter safety, and resources at risk. Protect all areas while being consistent with resource objectives. Defend protection priority areas and contain fires within Army installation boundaries while reducing wildfire impacts to the environment.

(6) Prevention. Concerted efforts to minimize wildfire caused by military activities must be implemented and enforced.

(7) Protection Priorities. Besides the safety priority to human life, protection priorities will be established among all resources. Priority between property and natural/cultural resources must be based on values to be protected.

(8) Interagency Cooperation. Planning, preparedness, suppression, monitoring, and research will be conducted on an interagency basis to maximize effort and resources.

(9) Standardization. Fire managers will use compatible planning and operational procedures.

(10) Economic Efficiency. Fire management activities will be based on economic analyses that incorporate resource and social values.

(11) Wildland/Urban Interface. The role of structure protection within the wildland/urban fire protection is considered a part of wildland fire suppression and management.

(12) Employee Roles. Employees who are required to be trained and certified will participate in the wildfire program, as the situation demands or as directed.

4. Goals. Consistent with the Army Wildland Fire Policy Guidance, the 25th ID(L) & USARHAW Wildfire Management Program will be accomplished through the following fire management goals:

a. Safety.

(1) Goal. Goal is to have no human losses or injuries due to wildfire. Every firefighter, fire supervisor, fire manager, and administrator taken will take positive action to ensure compliance with safe practices.

(2) Objective. Establish fire management qualifications and ensure all personnel assigned to those positions are properly trained. Managers will ensure training tools are available and proper training is conducted. Personnel are the highest value to be protected.

b. Pre-Suppression.

(1) Goal. Maintain preparedness planning and suppression programs to prevent unacceptable losses from fire.

(2) Objectives. Define priorities that recognize the relative values of property and natural/cultural resources to be protected by working in cooperation with other managers to develop priorities. Reduce the environmental impacts of fire. Reduce environmental impacts of pre-suppression and suppression activities while also protecting vegetation so concealment cover is available for military training. Plan suppression based on confine, contain, and control strategies for each of the fire management areas within wildfire management capabilities. Develop and implement pre-suppression prevention measures including education and fuel management. Establish criteria and procedures for military training that minimize fire ignition in fire prone and sensitive areas.

c. Suppression.

(1) Goal. Protection capability - maintain sufficient fire suppression and support capability.

(2) Objectives. Use protection priorities as criteria to assess overall suppression and support requirements, examine and identify resource requirement and availability at each organizational level to provide needed suppression and support. This will include planning for both initial attack and extended attack. Establish suppression measures and determine the confine, contain, and control strategies.

5. Responsibilities.

a. Commander, 25th ID(L) & USARHAW. As the Installation Commander is responsible for all environmental and fire protection requirements on U.S. Army property within the State of Hawaii under his command.

b. Commander, United States Army Garrison, Hawaii (USAG-HI). The Garrison Commander defines the roles and responsibilities for environmental and wildland fire management on the installation; plans and programs resources; designates the installation Wildland Fire Program Manager; and approves the IWFMP.

c. Director, Installation Fire & Safety Office (IFSO). The IFSO Director maintains oversight of the overall safety and fire protection mission for the installation and is the proponent for the Wildfire Management Program. As the Command Fire Marshal, exercises authority of the Army Fire & Emergency Services and is responsible for implementing the provisions outlined in the IWFMP.

(1) Installation Fire Chief, Fire & Emergency Services. The Installation Fire Chief is responsible for the management of fire and emergency services for Army installations on Oahu and serves as a liaison with the Federal Fire Department (FFD), Navy Region Hawaii. The Installation Fire Chief also provides management oversight for the Kilauea Military Camp (KMC) and Pohakuloa Training Area (PTA) fire departments on the Big Island of Hawaii, and provides supervision to the installation Wildland Fire Program Manager.

(2) Wildland Fire Program Manager. The Wildland Fire Program Manager is responsible for the development and execution of the installation IWFMP. Additionally, reviews and approves burn plans for prescribed fires to ensure consistency with the IWFMP, the Integrated Natural Resource Management Plan (INRMP), and other applicable operating instructions such as state and local regulations. Collect and disseminate fire risk data from the fire danger rating system and adjust training limitations to prevent wildfires. Collaborate with other resource managers and cooperative fire agencies to ensure that supplies, equipment, training, and qualified personnel are available to meet the goals and objectives of the IWFMP. The wildland fire program manager shall coordinate with the range maintenance manager and Integrated Training Area Management (ITAM) coordinator to develop an annual work plan.

d. Assistant Chief of Staff (ACofS), G3/Director of Plans, Training, & Mobilization (DPTM). The ACofS, G3/DPTM is responsible for operational readiness and the management of military training activities on USARHAW training land, and will provide:

(1) Installation Operations Center (IOC) support through the Chief of Operations for central reporting and communication operations during extended fire suppression activities.

(2) Coordination through the Assistant Division Engineer (ADE) for engineer equipment to support wildfire emergency suppression operations and input for prioritization and direction for engineer pre-suppression activities.

(3) Coordination through the Assistant Division Aviation Officer (ADAO) for aircraft and aircrews to conduct aerial fire bucket operations to support wildfire suppression activities.

(4) Coordination through the Range Officer, G3/DPTM, Range Division Hawaii (RDH), who is responsible for enforcing the provisions of the IWFMP and other applicable training directives and regulations, including restrictions on or cessation of training activities based on the fire danger rating.

(5) Coordinate pre-suppression related projects; review range configuration and design to prevent training related wildfires; and provide initial attack capabilities utilizing qualified range personnel on small wildland fires.

e. Director of Resource Management (DRM). The DRM will provide resource and budget execution strategies for staffing and funding of the Wildfire Management Program.

f. Director of Public Works (DPW). The DPW will:

(1) Be responsible for supporting the wildland fire management program through its environmental, ecosystem, and natural/cultural resource plans.

(2) Provide environmental oversight, technical support, and planning assistance (for environmental fire effects, protection priority, and post-fire restoration).

(3) Request funding for environmental compliance-related fire programs or projects under the Environment Program Requirements (EPR).

(4) Assist in planning, monitoring work order requests for timely execution of maintenance, improvement, and construction of fire related projects.

(5) Provide engineering support through work management for work orders and contracts to support wildfire management program. Additionally, provides support with Troop Construction Coordination Committee (TCCC) project planning and execution.

g. Director of Logistics (DOL). The DOL will provide maintenance on fire equipment to include fire suppression vehicles on a reimbursable basis; assist in procurement of required fire equipment and supplies when requisitioned through supply channels by the IFSO.

h. Unit Commanders and Division Chiefs. Commanders, managers, and supervisors at all levels of the organization are responsible for ensuring unit personnel are familiar with and responsible for complying with the provisions of this plan and applicable regulations, fire prevention restrictions, and training activities within biologically sensitive areas in support the Wildfire Management Program.

i. Federal Fire Department (FFD), Navy Region Hawaii. Fire Chief, FFD, is responsible for providing wildland fire suppression support and coordination with the Army in accordance with the interservice support agreement (ISA); and for coordinating Army-sponsored annual wildland fire training requirements with the installation Wildland Fire Program Manager.

6. Actions.

a. Wildland fire standing operating procedures (SOPs) have been developed for each fire management area and are incorporated in the IWFMP. Applicable portions of the wildland fire SOPs are to be incorporated into the training SOPs for each range and training area.

b. The prevention of wildfires will be briefed during all courses of training addressing the scheduling, usage, and management of range and training areas. Fire prevention will be stressed and reinforced at all commanders' courses, range officer-in-charge/safety officers' courses, resource scheduling conferences, range briefings, and environmental briefings, and will be included in all publications distributed to training units prior to use of our facilities.

c. It is the responsibility of every individual assigned to this command to enforce wildfire prevention. Commanders, directors, soldiers, or civilians with knowledge of a potential start of wildfires must take immediate action to correct and report such actions. Commanders and staff will ensure SOPs are available for using units. Due to the dangerous nature of fire and wildfire suppression, the risk of starting a wildfire will be addressed in the commander's risk assessment that is made prior to start of training.

d. The IWFMP must integrate with other resource installation management programs. This is one of several programs that fit within the larger framework in the management of Army lands. This plan is compliant and is an integral part of the INRMP, ICRMP, Installation Master Plan, Range and Training Land Plan, and installation's Fire & Emergency Services Program plans. The IWFMP describes pre-suppression, suppression, post-fire activities, and how fire management actions are integrated with other resource management programs to accomplish the overall ecosystem management goal.

e. Wildland Fire Training, Certification, and Fitness Standards.

(1) Army organizations involved in wildland fire activities will incorporate NWCG standards into their organizational structure when necessary to accommodate cooperation and integration with other federal, state, and local wildland fire organizations across jurisdictional boundaries.

(2) All civilian, contractor, and emergency services personnel involved in wildland fire management must possess NWCG certifications appropriate for their expected level of involvement in the wildland fire organization. All personnel dispatched or assigned to wildfires or prescribed fires will be qualified for the fire position assigned. Individuals will not be assigned to duties for which they lack training and/or certified experience.

(3) The Wildland Fire Program Manager will administer and manage an effective qualification training and certification program, in coordination with the Federal Fire Department. Courses identified should be based upon the needs and goals established to meet the IWFMP.

(4) All Army personnel must meet the NFPA or NWCG Standards for certification. The USARHAW wildland fire management training is based on criteria specified within the training curriculum approved by the NWCG. All 25th ID(L) & USARHAW employees and military personnel engaged in suppression and prescribed fire responsibilities shall meet the standards set forth in this IWFMP.

f. Incident Command System (ICS). The Army will utilize the ICS that establishes command and control of fire suppression based on training qualifications and assignment to ICS positions/roles established in the IWFMP. The ICS will be used, at the appropriate level, for all wildfire responses. Only personnel trained to fill a specific ICS position, or the next higher position will support, plan, or supervise wildfire suppression. Untrained commanders, directors and supervisors will not attempt to interfere with the Incident Commander (IC) during fire suppression activities.

g. Use of Military Aircraft.

(1) Military aircraft may be used for wildland fire suppression as outlined in the IWFMP. The use of certain training areas requires mandatory scheduling of helicopters to conduct aerial fire bucket operations.

(2) Military helicopters assigned to conduct fire bucket missions on military installations are normally activated by request through the Army's IOC located at Schofield Barracks. In turn, the IOC will activate the aviation unit assigned to respond to the fire incident. At PTA, a private helicopter module (helicopter, pilot, and service support) contracted by the Army is the preferred approach if no military aircraft are present at PTA.

(3) In addition, all pilots and air crew engaged in fire suppression will receive training in fire bucket application techniques, and will have a basic understanding of fire tactics, strategy, and wildfire behavior.

7. Funding.

a. Funding for IWFMP implementation, wildland fire prevention, fuel management for hazard reduction, wildland fire suppression, prescribed burning, and other wildland fire management is an installation operations and maintenance responsibility. Resource planning and programming responsibility shall be addressed in the next Program Objective Memorandum (POM) cycle in FY05.

b. A wildfire management account must be established. Budget development must include budgeting protocol to include integration of other installation resource management plans to accomplish planned activities outlined in this IWFMP. Total wildfire budget requirements will be identified by the Wildland Fire Program Manager.

c. Wildland fire management activities conducted for the purpose of compliance with environmental laws and regulations will be supported by environmental conservation funds.

d. The Integrated Training Area Management (ITAM) funds may be used for construction and maintenance of fire/fuel breaks, or other fuel removal directly associated with ranges/training areas.

e. Mission activities, e.g., training and testing, may support wildland fire management and suppression, as required and agreed upon, by the participating organizations. The Garrison Commander or his designee will mediate and organize such arrangements.

f. Wildfire budget requirements are addressed in the IWFMP. Although previous fire management actions have already been identified, accomplished, and funded from other programs, fire management actions must be identified in the next POM and will be implemented over the next five years (FY05-FY09). Wildfire funding has been identified as an unresourced requirement (URR) by the IFSO for FY04.

g. Wildfire funding also includes a mutual assistance component. Currently, USARHAW is not billed for mutual assistance rendered by other agencies, nor are other fire agencies billed by USARHAW. A review of existing mutual aid agreements between the USARHAW and other fire agencies indicate that formal agreements have expired and some must be reviewed and updated as required.

8. Expiration date. This policy memorandum supersedes Policy Memorandum G3-3, Wildfire Management Program, dated 4 April 2000, and remains in effect until canceled or superseded in writing.

9. Proponency. The Installation Fire & Safety Office, Fire & Emergency Services, 656-0615, is the proponent for administration of this Wildfire Management Program.

ERIC T. OLSON
Major General, USA
Commanding

Encl
as

DISTRIBUTION:
B
Plus 2-Federal Fire Department

Approved by: _____ Date: 2 Dec 03
ERIC T. OLSON
Major General, USA
Commanding

Approved by: _____ Date: 10/16/03
DAVID L. ANDERSON
Colonel, USA
Commanding

Approved by: _____ Date: 10/15/03
SAMMY C. HOUSEBERG
Director, Installation Fire & Safety Office

Reviewed by: _____ Date: 10/15/03
GEORGE T. WILDER
Installation Fire Chief, US Army Garrison, Hawaii

Reviewed by: _____ Date: 10/15/03
GAYLAND D. ENRIQUES
Installation Wildland Fire Program Manager

Reviewed by: _____ Date: 10/15/03
FLOYD QUINTANA
COL ~~LTC,~~ EN
Director of Public Works

Reviewed by: _____ Date: 18 oct 03
JAMES C. BOISSELLE
LTC, GS
ACofS, G3/DPTM

Reviewed by: _____ Date: 10/16/03
FREDERICK CLARKE
LTC, AD
Commander, Pohakuloa Training Area

Reviewed by: _____ Date: 10/14/03
MICHAEL P. JONES
Fire Chief
Federal Fire Department
Navy Region Hawaii

TABLE OF CONTENTS

EXECUTIVE SUMMARY ..... **xi**

CHAPTER 1 - GENERAL OVERVIEW

1.1 Overview ***1-1***
1.1.1 Existing Conditions *1-1*
1.1.2 Purpose *1-1*
1.1.3 Scope *1-1*

1.2 Goals and Objectives ***1-1***
1.2.1 Goals *1-1*
1.2.2 General Objectives *1-1*
1.2.3 Specific Objectives *1-3*
1.2.4 Policy *1-4*

1.3 Wildland Fire Organization and Review ***1-4***
1.3.1 Fire Management Areas *1-4*
1.3.2 Wildland Fire Managers *1-4*
1.3.3 IWFMP Review Process *1-4*

1.4 Environmental Stewardship ***1-5***
1.4.1 Environmental Issues *1-5*
1.4.2 Fire Threats to the Environment *1-5*

CHAPTER 2 - INTRODUCTION

2.1 General Overview ***2-1***

2.2 Effects on Military Training ***2-1***

2.3 Values to Be Protected ***2-2***
2.3.1 Personnel Safety *2-2*
2.3.2 Structures and Infrastructure *2-2*
2.3.3 Natural/Cultural Resources *2-2*

2.4 Wildland Fire Fighting Resources ***2-3***
2.4.1 Federal Fire Department *2-3*
2.4.2 Pohakuloa Training Area Fire Department *2-3*
2.4.3 IFSO Strike Team *2-3*
2.4.4 G3/DPTM Range Division Hawaii, Auxiliary Wildland Fire Fighting Force *2-3*
2.4.5 Outside Agencies *2-4*

CHAPTER 3 - ENVIRONMENTAL CONDITIONS AND FIRE EFFECTS

3.1 Setting 3-1
3.1.1 Location 3-1
3.1.2 Geography 3-1
3.1.3 Climate 3-1
3.1.4 Flora 3-2
3.1.5 Fauna 3-2

3.2 Regulatory Requirements 3-2
3.2.1 Endangered Species Act 3-2
3.2.2 National Historic Preservation Act 3-3
3.2.3 Clean Air Act 3-3

3.3 Resource Management Programs 3-4
3.3.1 Natural/Cultural Resource Management 3-4
3.3.2 Integrated Natural/Cultural Resource Management Plans (INRMP/ICRMP) 3-4
3.3.3 Ecosystem Management Plan 3-4
3.3.4 Integrated Training Area Management (ITAM) 3-5

3.4 Fire Effects 3-5
3.4.1 Fire Ecology 3-5
3.4.2 Vegetation Effects 3-5
3.4.3 Role of Fire 3-6

3.5 Fuels 3-6
3.5.1 General Wildfire Fuels 3-6
3.5.2 Fuels Classification 3-6
3.5.3 Fuel Types 3-7

3.6 Fire Behavior and Fuel Models 3-9
3.6.1 Fire Behavior 3-9
3.6.2 Fuel Models 3-9

3.7 Fuel Load 3-10

3.8 Fire History 3-10
3.8.1 General History 3-10
3.8.2 Fire History on Army Lands 3-11

3.9 Ignition Sources 3-11

CHAPTER 4 - PRE-SUPPRESSION ACTIONS

4.1 Prevention 4-1
4.1.1 Fire Prevention Program 4-1
4.1.2 Education 4-1
4.1.3 Enforcement 4-2
4.1.4 Engineering 4-3
4.1.5 Ignition Control 4-3

4.2 Pre-Suppression Planning 4-4
4.2.1 Personnel Safety 4-4
4.2.2 Minimum Staffing Requirements 4-5
4.2.3 Fire Equipment and Supplies 4-6
4.2.4 Remote Automated Weather Stations (RAWS) 4-9
4.2.5 Cooperative Wildland Fire Fighting Resources 4-10
4.2.6 Fire Danger Rating System (FDRS) 4-10
4.2.7 Fire Response Planning 4-11
4.2.8 Pre-Suppression Priority 4-11

4.3 Fuels Management 4-12
4.3.1 Fuelbreaks, Firebreaks, and Natural Barrier Systems 4-12
4.3.2 Standards for USARHAW Fire and Fuelbreaks 4-14
4.3.3 Fuels Modification 4-16

4.4 Use of Prescribed Fire 4-18
4.4.1 General 4-18
4.4.2 Objective 4-18
4.4.3 Policy 4-18
4.4.4 Responsibilities 4-19
4.4.5 Prescribed Fire Ignitions 4-20
4.4.6 Prescribed Fire Requirements 4-21
4.4.7 Prescribed Fire Organization 4-24

4.5 Preplanning Water Resources 4-29

4.6 Firefighter Training 4-29
4.6.1 General 4-29
4.6.2 Description of the Program 4-30
4.6.3 Certification 4-31
4.6.4 Fitness Standards 4-33
4.6.5 Responsibilities 4-34
4.6.6 Complexity of Incidents for Qualification 4-36
4.6.7 Position Categories 4-38

CHAPTER 5 - FIRE SUPPRESSION ACTIONS

5.1 Responsibilities 5-1
5.1.1 USARHAW, Installation Fire and Safety Office 5-1
5.1.2 USARHAW, G3/DPTM, Range Division Hawaii (Range Control) 5-1
5.1.3 PTA Fire Department 5-1
5.1.4 Federal Fire Department 5-1

5.2 Fire Suppression Actions 5-1
5.2.1 Fire Suppression 5-1
5.2.2 Standing Operating Procedures 5-1
5.2.3 Fire Management Strategies 5-2
5.2.4 Fire Management Options/Alternatives 5-3
5.2.5 Description of Management Options 5-4

5.3 Special Considerations for Suppression on USARHAW Lands 5-5
5.3.1 Minimum Impact Suppression 5-5
5.3.2 Methods to Reduce Impacts..... 5-5
5.3.3 Protection of Natural and Cultural Resources..... 5-7

5.4 Fire Detection and Reporting 5-7

5.5 Initial and Extended Attack 5-7
5.5.1 Initial Attack..... 5-7
5.5.2 Extended Attack..... 5-10
5.5.3 Fire Suppression Strategy..... 5-10

5.6 Communication..... 5-15
5.6.1 General..... 5-15
5.6.2 Types of Communications..... 5-15
5.6.3 Agencies 5-15
5.6.4 Radio Networks..... 5-16
5.6.5 Radio Frequencies..... 5-17

5.7 Air Operations 5-22
5.7.1 Objective..... 5-22
5.7.2 References 5-23
5.7.3 Aircraft Use 5-23
5.7.4 Proponency..... 5-24
5.7.5 Notification 5-24
5.7.6 Aircraft Alert Response Schedule..... 5-26
5.7.7 Command and Control 5-26
5.7.8 Aerial Fire Bucket Operations 5-27
5.7.9 Execution 5-28
5.7.10 Unit Responsibilities..... 5-29
5.7.11 Qualification/Currency..... 5-29
5.7.12 Aviation Procedures..... 5-29
5.7.13 Bucket Specifications..... 5-30
5.7.14 Special Requirements..... 5-31
5.7.15 Air Operations Safety..... 5-32
5.7.16 Airspace..... 5-32

5.8 Unexploded Ordnance (UXO)..... 5-44

5.9 Mutual Aid Support Agreements..... 5-45

CHAPTER 6 - POST FIRE ACTIONS

6.1 Records and Reports..... 6-1
6.1.1 USARHAW Wildland Fire Incident Report 6-1
6.1.2 Federal Fire Department Reports..... 6-2
6.1.3 Fire Report to U.S. Fish & Wildlife Service (USFWS) 6-2

6.2 Reviews and Formal Investigations..... 6-2
6.2.1 Informal Reviews 6-2
6.2.2 Formal Investigations..... 6-2

6.3 Post-Fire Analysis 6-3
6.3.1 Surveys 6-3
6.3.2 Analysis 6-4
6.3.3 Post-Fire Restoration 6-4

CHAPTER 7 - FIRE MANAGEMENT AREAS

7.1 General Description of Fire Management Areas 7-1
7.1.1 General 7-1
7.1.2 Oahu FMAs 7-1
7.1.3 Island of Hawaii (The Big Island) 7-2

7.2 Dillingham Military Reservation (DMR) 7-3
7.2.1 General Description 7-3
7.2.2 Vegetation Fuels Classification 7-4
7.2.3 Fire History for DMR 7-4
7.2.4 Resource Protection 7-4
7.2.5 Fire Protection 7-9
7.2.6 Project Budget FY 03 to 05 7-11

7.3 Kawailoa Training Area (KLOA) 7-12
7.3.1 General Description 7-12
7.3.2 Vegetation Fuels Classification 7-13
7.3.3 Fire History for KLOA 7-13
7.3.4 Resource Protection 7-13
7.3.5 Fire Protection 7-16
7.3.6 Project Budget FY 03 to 05 7-16

7.4 Kahuku Training Area (KTA) 7-19
7.4.1 General Description 7-19
7.4.2 Vegetation Fuels Classification 7-20
7.4.3 Fire History for KTA 7-22
7.4.4 Resource Protection 7-22
7.4.5 Fire Protection 7-24
7.4.6 Project Budget FY 03 to 05 7-24

7.5 Makua Military Installation (MMR) 7-27
7.5.1 General Description 7-27
7.5.2 Vegetation Fuels Classification 7-28
7.5.3 Fire History for MMR 7-31
7.5.4 Resource Protection 7-33
7.5.5 Fire Protection 7-35
7.5.6 Project Budget FY 03 to 05 7-40

7.6 Pohakuloa Training Area (PTA) 7-44
7.6.1 General Description 7-44
7.6.2 Vegetation Fuels Classification 7-45
7.6.3 Fire History for PTA 7-45
7.6.4 Resource Protection 7-51
7.6.5 Fire Protection 7-57
7.6.6 Project Budget FY 03 to 05 7-62

7.7 Schofield Barracks East Range (SBER) 7-66
7.7.1 General Description 7-66
7.7.2 Vegetation Fuels Classification 7-67
7.7.3 Fire History for SBER 7-67
7.7.4 Resource Protection 7-67
7.7.5 Fire Protection 7-75
7.7.6 Project Budget FY 03 to 05 7-75

7.8 Schofield Barracks Military Reservation (SBMR) 7-77
7.8.1 General Description 7-77
7.8.2 Vegetation Fuels Classification 7-78
7.8.3 Fire History for SBMR 7-81
7.8.4 Resource Protection 7-83
7.8.5 Fire Protection 7-87
7.8.6 Project Budget FY 03 to 05 7-87

7.9 South Range Acquisition Area (SRAA) 7-92
7.9.1 General Description 7-92
7.9.2 Vegetation Fuels Classification 7-92
7.9.3 Fire History for SRAA 7-93
7.9.4 Resource Protection 7-93
7.9.5 Fire Protection 7-96
7.9.6 Project Budget FY 03 to 05 7-96

APPENDIX 1 - WILDLAND FIRE STANDING OPERATING PROCEDURES

Dillingham Military Reservation Standing Operating Procedures

Kahuku Training Area Standing Operating Procedures

Kawailoa Training Area Standing Operating Procedures

Makua Military Reservation Standing Operating Procedures

Pohakuloa Training Area Standing Operating Procedures

Schofield Barracks East Range Standing Operating Procedures

Schofield Barracks Military Reservation Standing Operating Procedures

South Range Acquisition Area Standing Operating Procedures

APPENDIX 2 - INTERAGENCY COOPERATIVE AGREEMENTS

APPENDIX 3 - WILDLAND FIRE PROGRAM BUDGET

APPENDIX 4 - LIST OF ACRONYMS

LIST OF TABLES

Table 4.1 Minimum Specifications for USARHAW Fire and Fuelbreaks 4-15
Table 7.2.1 Fuel Types at DMR 7-4
Table 7.2.2 DMR Pre-Suppression Priority 7-7
Table 7.2.3 Federally Listed Endangered and Threatened Species at DMR 7-11
Table 7.3.1 Fuel Types at KLOA 7-13
Table 7.3.2 Federally Listed Endangered and Threatened Species at KLOA 7-18
Table 7.4.1 Fuel Types at KTA 7-20
Table 7.4.2 KTA Pre-Suppression Priority 7-24
Table 7.4.3 Federally Listed Endangered and Threatened Species at KTA 7-26
Table 7.5.1 Fuel Types at MMR 7-28
Table 7.5.2 MMR Pre-Suppression Priority 7-35
Table 7.5.3 Federally Listed Endangered and Threatened Species at MMR 7-43
Table 7.6.1 PTA Pre-Suppression Priority 7-57
Table 7.6.2 Federally Listed Endangered and Threatened Species at PTA 7-65
Table 7.7.1 Fuel Types at SBER 7-67
Table 7.7.2 SBER Pre-Suppression Priority 7-71
Table 7.7.3 Federally Listed Endangered and Threatened Species at SBER 7-76
Table 7.8.1 Fuel Types at SBMR 7-78
Table 7.8.2 SBMR Pre-Suppression Priority 7-84
Table 7.8.3 Federally Listed Endangered and Threatened Species at SBMR 7-91
Table 7.9.1 Fuel Types at SRAA 7-93
Table 7.9.2 Federally Listed Endangered and Threatened Species at SRAA 7-98

LIST OF REFERENCES

Reference 4.2.1 Minimum Fire Cache Resources 4-6
Reference 4.2.2 Mandatory Personal Protective Equipment List for Firefighters 4-7
Reference 4.2.3 Remote Automated Weather Stations (RAWS) Site Locations 4-9
Reference 4.4.1 Prescribed Fire Qualifications 4-28
Reference 4.6.2 Training Courses, Incident Command System 4-42
Reference 4.6.3 Wildland Firefighter Training Qualification Requirements for Assigned Personnel 4-43
Reference 4.6.4 Wildland Firefighter Training Qualification Requirement Flow Charts 4-44
Reference 5.5.1 Cooperative Wildland Firefighting Resources 5-9
Reference 5.5.2 Operational Decision Chart (Initial Attack Plan) 5-11
Reference 5.5.3 Operational Decision Chart (Extended Attack Plan) 5-12
Reference 5.5.4 Operational Decision Chart (Escape Fire Situation Plan) 5-13
Reference 5.5.5 Operational Decision Chart (Monitoring Procedures) 5-14
Reference 5.6.1 Interagency Radio Frequency List (Oahu Only) 5-18
Reference 5.6.2 PTA Radio Frequency List (PTA & KMC Only) 5-19
Reference 5.6.3 Interagency Radio Frequency List (Island of Hawaii Only) 5-20
Reference 5.7.1 Fire Bucket "Bambi" Model, Capacity, and Weight Specifications 5-27
Reference 5.7.2 Helicopter Fire Bucket Lift Capacities 5-28
Reference 5.7.3 Bambi Bucket: (Model 2024) Fill Capacities and Gross Weight 5-30
Reference 5.7.4 Griffin Big Dipper Bucket (Model 1250) Fill Capacities and Gross Weight 5-31
Reference 5.7.5 25th ID(L) & USARHAW Fire Bucket Support Communication Plan 5-33
Reference 5.7.6 Requesting DoD Assets Under Joint Services Operating Procedures 5-34
Reference 5.7.7 Requesting DoD Assets Under Joint Services Operating Procedures Under Federal Response Plan 5-35
Reference 5.7.8 Request Form for Rotary Winged Aircraft 5-36
Reference 5.7.9 Aerial Fire Bucket Water Resource Locations 5-37
Reference 5.7.10 Aerial Fire Bucket After Action Report Format 5-38
Reference 5.7.11 Aviation Task: Perform Fire Bucket Operations (Task 3016) 5-39
Reference 7.5.1 MMR Fire History 7-32
Reference 7.6.1 PTA Fire History 7-52
Reference 7.8.1 SBMR Fire History 7-82

LIST OF FIGURES

Figure 1 *Fire Management Areas* *1-2*
Figure 2 *Dillingham Military Reservation – Fuels* *7-5*
Figure 3 *Dillingham Military Reservation – Pre-Suppression Priority* *7-8*
Figure 4 *Dillingham Military Reservation – Firebreaks and Fuels Management* *7-10*
Figure 5 *Kawailoa Training Area – Fuels* *7-14*
Figure 6 *Kawailoa Training Area – Firebreaks and Fuels Management* *7-17*
Figure 7 *Kahuku Training Area – Fuels* *7-21*
Figure 8 *Kahuku Training Area – Pre-Suppression Priority* *7-25*
Figure 9 *Makua Military Reservation – Fuels* *7-29*
Figure 10 *Makua Military Reservation – Pre-Suppression Priority* *7-37*
Figure 11 *Makua Military Reservation – Firebreaks and Fuels Management* *7-41*
Figure 12 *Pohakuloa Training Area – Fuels* *7-49*
Figure 13 *Pohakuloa Training Area – Pre-Suppression Priority* *7-59*
Figure 14 *Pohakuloa Training Area – Firebreaks and Fuels Management* *7-63*
Figure 15 *Schofield Barracks East Range – Fuels* *7-69*
Figure 16 *Schofield Barracks East Range – Pre-Suppression Priority* *7-73*
Figure 17 *Schofield Barracks Military Reservation – Fuels* *7-79*
Figure 18 *Schofield Barracks Military Reservation – Pre-Suppression Priority* *7-85*
Figure 19 *Schofield Barracks Military Reservation – Firebreaks and Fuels Mgmt* *7-89*
Figure 20 *South Range Acquisition Area – Fuels* *7-94*
Figure 21 *South Range Acquisition Area – Pre-Suppression Priority* *7-95*
Figure 22 *South Range Acquisition Area – Firebreaks and Fuels Management* *7-97*
Figure DMR – 1 *DMR – Fire Suppression Resource Locations* ..... *DMR SOP-2*
Figure DMR – 2 *DMR – Protected Resources* ..... *DMR SOP-4*
Figure KTA – 1 *KTA – Fire Suppression Resource Locations* ..... *KTA SOP-2*
Figure KTA – 2 *KTA – Protected Resources* ..... *KTA SOP-4*
Figure KLOA – 1 *KLOA – Fire Suppression Resource Locations* ..... *KLOA SOP-2*
Figure KLOA – 2 *KLOA – Protected Resources* ..... *KLOA SOP-4*
Figure MMR – 1 *MMR – Fire Suppression Resource Locations* ..... *MMR SOP-3*
Figure MMR – 2 *MMR – Protected Resources* ..... *MMR SOP-5*
Figure PTA – 1 *PTA – Fire Suppression Resource Locations* ..... *PTA SOP-3*
Figure PTA – 2 *PTA – Protected Resources* ..... *PTA SOP-7*
Figure PTA – 3 *PTA – Fire Danger Rating Areas* ..... *PTA SOP-31*
Figure SBER – 1 *SBER – Fire Suppression Resource Locations* ..... *SBER SOP-3*
Figure SBER – 2 *SBER – Protected Resources* ..... *SBER SOP-7*
Figure SBMR – 1 *SBMR – Fire Suppression Resource Locations* ..... *SBMR SOP-3*
Figure SBMR – 2 *SBMR – Protected Resources* ..... *SBMR SOP-7*
Figure SRAA – 1 *SRAA – Fire Suppression Resource Locations* ..... *SRAA SOP-2*

Executive Summary

Wildfire poses a significant threat to the sensitive ecosystems, cultural sites, and training lands of the U.S. Army, Hawaii (USARHAW). The mission of the 25th Infantry Division (Light) is to fight and win military conflicts. This requires the use of munitions and weapons systems that often increase the chance of wildfire ignition and may damage important resources. This Integrated Wildland Fire Management Plan (IWFMP) presents a comprehensive approach to reduce the frequency of wildfires and the associated costs and damages. USARHAW will implement this plan to comply with all applicable laws and regulations, to fulfill the requirements established by the Army Wildland Fire Policy Guidance dated September 2002, and to reduce the impacts of training related fires.

The IWFMP lays out specific guidance, procedures, and protocols in the prevention and suppression of wildfires on all USARHAW training lands with wildland fuels. Its goal is to convey the methods and protocols necessary to minimize fire frequency, severity, and size. At the same time it will allow military units to maintain a high level of combat readiness. It defines responsibilities of all offices, departments, and agencies involved, and describes fire pre-suppression and suppression actions to be taken on strategic as well as tactical bases. The document is organized around general wildfire management information; installation specific information, requirements, and upgrades; and Standing Operating Procedures (SOPs) for wildfire management actions at each installation.

The Installation Fire and Safety Office (IFSO) is the proponent for this plan. In addition to the IFSO, individual wildland fire managers are the Director of Installation Fire and Safety, as the Command Fire Marshal; the Installation Fire and Safety Office, Wildland Fire Program Manager; the Installation Fire and Emergency Services, Fire Chief; the Pohakuloa Training Area, Deputy Fire Chief; the Installation Fire and Safety Office, PTA Wildland Fire Coordinator; the Federal Fire Department, Fire Chief.

USARHAW will implement improvements to its land and firefighting resources that will enhance the response and capabilities of firefighters. Chief among these is establishment of a ten-person strike team that will serve as the primary initial attack force and will be under the direct control of the IFSO Wildland Fire Program Manager. Range Division, Hawaii will continue as first responders and provide initial attack on small, incipient fires until the IFSO Strike Team is fully functional.

Additionally, the IFSO will explore the possibility of purchasing at least one helicopter and employing the necessary crew to man it. This helicopter will be required to respond to any fire on USARHAW lands on Oahu or, if need be, to provide extended attack support for fires at PTA.

A number of firebreaks, fuelbreaks, and other wildland fire management improvements that will aid firefighters in containing and suppressing fires will be constructed. Some of these will also serve to help keep non-military ignited fires off of Army lands. The IFSO will employ a Pohakuloa Training Area (PTA) Wildland Fire Coordinator to manage the numerous fire related projects and regular maintenance requirements there.

Range Division, Hawaii and specifically Range Control, will implement and strictly enforce a Fire Danger Rating System (FDRS) for each of the installations under its jurisdiction. This system will restrict weapons fire and training depending on weather and vegetation conditions. Range Control will be responsible for retrieving the necessary weather data collected by

weather stations on the various installations, and communicating to training units any restrictions imposed as a result of adverse weather and/or fuel conditions. Range Control will ensure that restrictions are adhered to and that appropriate administrative disciplinary action is taken for non-compliance on the part of individual units and/or Officers in Command.

USARHAW will continue to expand its network of Remote Automated Weather Stations (RAWS) such that at least one weather station is functioning at each installation. Weather data from these stations will continue to be archived to provide a database from which future weather analyses may be possible.

This plan will be reviewed and updated bi-annually to ensure the latest information is consistently incorporated into Army wildfire prevention and suppression procedures. An ad hoc review committee will be convened by the Wildland Fire Program Manager and will consider fire activity, and prevention and response effectiveness. They will conduct an audit of fire expenses and recommend what, if any, changes are necessary to improve the wildfire management program. In addition, this plan is a living document and may be changed as necessary to account for the constantly evolving requirements placed on the Wildland Fire Management Program.

1.1. OVERVIEW.

1.1.1. Existing Conditions. The juxtaposition of military training on locations of high ecologic and historic value in Hawaii presents a situation in which the utmost care must be taken to ensure the continued viability of these unique natural and cultural resources. Wildfire is a threat to these as well as to the ability of military trainers to complete their mission. The realities of military training, the prevalence of flammable wildfire fuel types on U.S. Army Hawaii (USARHAW) installations, the extreme topography, and the year round fire season together represent a nearly unique fire management scenario.

1.1.2. Purpose. In the past, military activities on Army lands have resulted in the loss of native vegetation and threatened the habitat of federally protected species of plants and animals. This Integrated Wildland Fire Management Plan (IWFMP) has been developed to help meet the land stewardship responsibilities of USARHAW and comply with applicable federal and state environmental statutes, while at the same time allowing the 25th ID(L) and other military units to accomplish their mission of maintaining a high level of combat readiness. It lays out specific guidance, procedures, and protocols in the prevention and suppression of wildfires on Army training lands in Hawaii.

1.1.3. Scope. This IWFMP covers all lands administered or leased by USARHAW in the State of Hawaii (Figure 1). USARHAW land is found on the islands of Oahu and Hawaii (the Big Island). Training areas on Oahu are Dillingham Military Reservation (DMR), Kawailoa Training Area (KLOA), Kahuku Training Area (KTA), Makua Military Reservation (MMR), Schofield Barracks East Range (SBER), and Schofield Barracks Military Reservation (SBMR). Pohakuloa Training Area (PTA) is on the island of Hawaii. This plan also covers lands that may be acquired as part of the Stryker Brigade Combat Training (SBCT) Transformation. These additional lands include the South Range Acquisition Area (SRAA) on Oahu, the Keamuku Parcel on the Big Island, which will be treated as part of PTA, and three military vehicle trails, two on Oahu and one on the Big Island.

1.2. GOALS AND OBJECTIVES.

1.2.1. Goal. Lay out the methods and protocols necessary to control fire frequency, intensity, and size on USARHAW lands in order to comply with federal and state laws and meet USARHAW's land stewardship responsibilities. At the same time, provide for firefighter and public safety and allow continuation of military training necessary for the 25th Infantry Division (Light) (25th ID(L)) and other military units to maintain a high level of combat readiness.

1.2.2. General Objectives.

(a) Provide, first and foremost, for firefighter and public safety. All other objectives are secondary.

(b) Protect all natural and cultural resources, to the extent feasible, through a program of prevention, pre-suppression, and suppression. Support the goals and objectives of existing USARHAW land management plans.

US Army Hawaii Fire Management Areas

Fire Management Areas

Figure 1

N

1:500,000

0 10,000 20,000 Meters

0 10 20 Mile

Center for Environmental Management of Military Lands 2003

Legend

Installation Boundary

Roads

Primary

(c) Base all fire management activities on the best available science.

(d) Incorporate public health and environmental quality considerations into fire management planning and execution.

(e) Coordinate and cooperate where possible and beneficial with other federal, state, and local agencies.

(f) examine and identify resource requirement and availability at each organizational level, to provide needed suppression and support. Establish suppression measures and determine the confine, contain, and control strategies.

(g) Base fire management activities on the evaluation of economic factors that consider resource and social values.

(h) Continually evaluate and improve upon fire management policies and procedures with the goal of constantly improving the level of fire protection on USARHAW lands.

1.2.3. Specific Objectives

(a) Maintain or improve the quality of training lands represented within the installations of USARHAW.

(b) Allow military training to occur at the tempo required to maintain a high level of combat readiness.

(c) Prioritize installations and locations within installations for funding and implementation of fire management improvements.

(d) Establish a series of firebreaks and/or fuelbreaks at high fire risk installations to reduce the probability of a fire moving into high value areas or off installation. Establish monitoring protocols and minimum specifications for these breaks.

(e) Control the timing of ignitions such that fires that occur do so when conditions are such that there is a high probability of controlling the fire and protecting all valued resources.

(f) Establish guidelines and implement a prescribed burn program that includes the use of wildland fires for resource benefit in predetermined areas and under predetermined conditions.

(g) Communicate within the fire management hierarchy to improve practices and policies. Communicate and educate other departments to facilitate a reduction in fire starts.

(h) Update interagency agreements as necessary to ensure prompt and complete cooperation during wildfire incidents both on USARHAW lands and those of other agreeing agencies.

(i) Establish fire management qualifications for all firefighters and fire managers and insure all personnel assigned to those positions are trained to a level appropriate for their expected duties.

(j) Fires will be suppressed at minimum cost while still considering firefighter and public safety and resources to be protected.

1.2.4. Policy. All policies in this document are in accordance with the 2001 Federal Wildland Fire Management Policy, to which the Department of Defense is a signature, the Army Wildland Fire Policy Guidance dated September 2003, and the USARHAW Commanding General's Policy Memorandum regarding the Wildfire Management Program. Accomplishment of the goals and objectives of this IWFMP depends on ensuring that policies are actively implemented and enforced. This will be the responsibility of fire managers at all levels. Fuel modification, soldier education, ignition control, and a quick wildfire response by appropriate resources will help to prevent the loss of sensitive habitat and the degradation of training lands.

1.3. WILDLAND FIRE ORGANIZATION AND REVIEW.

1.3.1. Fire Management Areas. The IWFMP is an overarching document based on a strategy linking all six (6) Oahu training areas, Pohakuloa Training Area (PTA) on the Island of Hawaii, and future purchases on both islands. Each installation has its own Wildfire Standing Operating Procedures (SOP) which have been developed specifically for resources, risks, and training that occur there and are published in Appendix 1. Each of these installations is referred to as a Fire management Area (FMA) Each FMA SOP provides specific guidance that delineate the responsibilities of the fire managers, Range Control staff, using training units, fire department personnel, and other agency cooperators in the prevention and suppression of fires.

1.3.2. Wildland Fire Managers. Wildland fire managers within USARHAW are:

a. Director of Installation Fire and Safety, as the Command Fire Marshal.

b. Installation Fire and Safety Office, Wildland Fire Program Manager.

c. Installation Fire and Emergency Services, Fire Chief.

d. Pohakuloa Training Area, Deputy Fire Chief.

e. Installation Fire and Safety Office, PTA Wildland Fire Coordinator.

f. Federal Fire Department, Fire Chief.

1.3.3. IWFMP Review Process. This IWFMP is a living document that allows flexibility to incorporate new data as it develops. This IWFMP will be reviewed biannually from the date of signature to ensure compliance with the standards, policies, and management goals outlined in this plan. The Installation Fire and Safety Office (IFSO) Wildland Fire Program Manager will convene an ad hoc evaluation team to review fire activity during the two years. The review team will analyze fire reports, evaluate the program, and develop a report to determine what, if any, policy or operational changes should be initiated. This review will include an audit of expenditures and an analysis of how well the allocated funding resources meet program management needs. It will also include a Fire Protection Operational Readiness Inspections and Environmental Compliance Assessment Screenings. Until superseded, the IWFMP will remain in effect. If changes are made to this IWFMP, the U.S. Fish & Wildlife Service (USFWS) shall review the amended IWFMP for compliance with the Endangered Species Act of 1973, as amended (ESA).

1.4. ENVIRONMENTAL STEWARDSHIP.

1.4.1. Environmental Issues. USARHAW lands contain many federal and state listed threatened and endangered species of plants and animals. These lands also contain areas that are culturally significant. The federal and State of Hawaii environmental laws and regulations with which USARHAW must comply protect both natural and cultural resources. This document provides USARHAW with a proactive approach to protecting its land resources.

1.4.2. Fire Threats to the Environment. The Hawaiian ecosystem is not resistant to, nor dependent on, fire. In addition to the statewide expansion of towns and suburban communities, military training can pose a threat to the natural habitats found on Army land. Military forces stationed in Hawaii are of the "light" force structure, meaning that the forces are made up of "light", or dismounted infantry or tactical units. Since light forces only move by foot, light wheeled vehicle, or helicopter, impact to the environment by movement is minimal. Wildfire is the single largest impact made of military activities on the Hawaiian ecosystem. The use of Army lands must include fire avoidance efforts. By following the guidelines in this IWFMP, the Wildland Fire SOPs, and the Range and Training Area SOPs, USARHAW can reduce wildfires and preserve its training assets.

2.1. GENERAL OVERVIEW.

a. Fires ignited from any source, including ammunition or military weapons systems, can alter the many components, structures, and processes of the Hawaiian ecosystem. The 'fire regime' is a measure of fire size, frequency, seasonality, intensity, and severity. Size and frequency combine to determine the proportion of the landscape touched by fire. Seasonality determines how fire interacts with the environment . Intensity and severity are defined by fire behavior and influence the after-effects, such as tree mortality, ground char, and seedling success. Fires can have dramatic effects across broad landscapes, or minimal impact in a small area. They can accelerate or retard the succession of seral stages, increase or reduce nutrient availability, and alter an ecosystem's physical structure. Whatever the impact, every fire is unique, and every fire contains considerable variability within its bounds.

b. The natural fire regime in Hawaii can be best described as low frequency and low severity. Few natural sources of ignition exist, natural fuel beds are often discontinuous, and the majority of the islands receive moderate to high levels of precipitation. In the past 100 years, invasion of alien vegetation has altered Hawaiian ecosystems dramatically, resulting in highly fire prone areas. Activities associated with military training increase the risk of unplanned fire ignitions through the use of ammunition and pyrotechnics. As alien grasses and their associated high frequency, higher severity fire regimes have modified the natural ecosystem, they have degraded the remaining native ecosystems and the small colonies of threatened and endangered species found therein. The spread and intensification of alien grasses increases the probability and frequency of fires. Native plants, not well adapted to intense and frequent fires, are easily outcompeted by their aggressive alien counterparts. As a result, fire in native habitats almost always converts native woodlands and forests to alien dominated savannas and grasslands, destroying the local biota.

2.2. EFFECTS ON MILITARY TRAINING.

Fire does not only affect ecosystems. It also affects the military's ability to accomplish its mission:

a. Endangerment to the Lives of Soldiers. Soldiers training in the field are normally on foot and have limited access to transportation. Fires that are driven by high winds could easily overtake soldiers, trapping them and ultimately causing injury or death.

b. Explosive Hazards. The explosive hazards inherent in military training in the field are multiplied when exposed to wildfire. Normal and unexploded ordnance on the ranges and in the training areas creates extremely hazardous conditions to personnel when they are in close proximity to a fire.

c. Loss of Access. Fires on Army land result in a loss of access to training areas and ranges either during or after a fire. When notified of a wildfire, Range Control will call for a cease-fire and close that particular range or training area. If the fire is out of control, adjacent areas may require evacuation as well.

d. Disruption of Training Schedules. Cease-fire and closures of ranges/training areas due to wildfires create a ripple effect from the range scheduling office down to the training unit. Rescheduling an area cannot always be accomplished within a unit's required time frame.

e. Destruction of Targets/Control Systems. Wildfire damage to electronic targets and associated control systems on live-fire range complexes can be extremely costly. The time necessary to repair these systems causes the loss of valuable training opportunities.

f. Destruction of Vegetation. Vegetation is used by the Army for cover, concealment and camouflage. Without this vegetation, training in the art of camouflage and concealment is rendered difficult or impossible. The absence of vegetation also promotes erosion, which in turn reduces trafficability and creates unsafe driving conditions during inclement weather.

g. Costs. Wildfires can be costly and impose damages that siphon off training funds. Damage to off-base resources also represent both economic and political costs. In Hawaii, tremendous resources are earmarked for conservation actions, due in large part to the damages caused by training related wildfires.

2.3. VALUES TO BE PROTECTED.

The values to be protected on Army training lands from wildfires include personnel safety, built up improvements (structures, electronic weaponry, and targets), high value natural resources such as Biological Sensitive Areas (BSA) and Sensitive Ecological Areas (SEA), and cultural resources. Priority protection is described for each FMA in Chapter 7 and the SOP for the FMA (See Appendix 1, SOPs for figures specific to each installation).

2.3.1. Personnel Safety. The primary concern during any fire is human safety and protection. For example, Schofield Barracks and Wheeler Army Airfield have a daytime population of over 50,000 people, including military and civilian staff and dependents. Neighboring towns and industrial areas provide additional priority protection considerations. Additionally, firefighters on the line, in the air, and at the command post must all be properly trained, outfitted, and informed of all threats and safety measures.

2.3.2. Structures and Infrastructure. All Army lands in Hawaii are associated with cantonment or built up improved areas. Schofield Barracks alone includes over 5,000 buildings, electronic training equipment, and military family housing units, with a total land and improvement value of well over $1 billion. In addition, there are tens of millions of dollars worth of equipment located on the training areas within high fire hazard vegetation.

2.3.3. Natural/Cultural Resources. There are many endangered species and archaeological sites found on Army training lands in Hawaii. The Army is committed to conserve, protect, and enhance these natural and cultural resources. Some training areas contain extremely significant concentrations of endangered species. While military training related factors such as munitions-caused fires may threaten the survival of certain endangered species, many species are also threatened by factors not related to military activities such as ungulate and carnivore predation, competition from alien species, and disease.

2.4. WILDLAND FIRE FIGHTING RESOURCES.

2.4.1. Federal Fire Department. Fire protection services on USARHAW installations on Oahu are provided by the consolidated Federal Fire Department (FFD) and Navy Region Hawaii through an Interservice Support Agreement (ISA). Fire protection services have generally been built around the structural fire department concept. In the past, wildland fire fighting has been a secondary function and has been the least planned and financed. The FFD has historically only been staffed to carry out the structural and/or airfield fire fighting missions on Army installations. The FFD will support USARHAW in the suppression of wildland fires on Army lands through the supply of trained personnel and equipment. Coordination and cooperation between FFD and Army firefighters are essential to the success of this IWFMP.

2.4.2. Pohakuloa Training Area Fire Department.

a. The PTA Fire Department currently provides fire protection services at PTA. The PTA Deputy Fire Chief is responsible to ensure that wildland fire response requirements at PTA are in accordance with this IWFMP, Army Regulations (AR 420-90), and Department of Defense Instruction (DoDI) 6055.6, Fire Protection Program.

b. An additional position will be added to the PTA Fire Department. This is the PTA Wildland Fire Coordinator who will work closely with the Wildland Fire Program Manager to facilitate pre-suppression actions on the Big Island and who will also assist in the fire fighting duties of the PTA Fire Department.

2.4.3. IFSO, Strike Team. The IFSO will acquire a ten person strike team that will eventually take over the responsibility of initial attack and first responders. This is currently handled by Range Control personnel (see below) who are trained for wildland fire fighting, but whose primary duties may conflict with fire suppression efforts. In order to remedy this situation and to give the IFSO Wildland Fire Program Manager direct oversight of fire fighting personnel, the IFSO will secure funding for staffing this strike team starting in FY05. The strike team will provide services beyond initial and extended attack including providing labor for fuels management, firebreak and fuelbreak maintenance, prescribed fire, and other labor intensive tasks; maintenance of RAWS, fire records, and analysis of fire records for trends; upkeep of fire fighting equipment including Bambi fire buckets, hummers, and water tenders; and other tasks determined at the discretion of the Wildland Fire Program Manager.

2.4.4. G3/DPTM, Range Division Hawaii, Auxiliary Wildland Fire fighting Force. An auxiliary wildland fire fighting force is established on Oahu and PTA to provide initial attack and to augment the PTA Army Fire Department (PTA FD) and FFD during wildfires. PTA Fire Department and FFD response times vary greatly depending upon the location of the closest fire station in relationship to the FMA. An auxiliary wildland fire fighting force from G3/DPTM, Range Division Hawaii (Range Control) is assigned as first responders to perform initial attack on range fires to minimize impacts. Upon notification or detection of a fire on the range, immediate deployment of Range Control personnel can help to suppress fires at the point of origin while fires are still small and prevent them from spreading. Initial attack by Range Control personnel will limit fire growth until the PTA Fire Department or FFD arrives on the scene, at which point Range Control personnel will then be available to complement their fire fighting efforts or return to their duty stations as the situation allows. Policy requires that all Range Control personnel engaged in fire suppression and prescribed fire duties meet the National

Wildland Coordinating Group (NWCG) standards referred to in this plan and the Department of the Army (DA) Wildland Fire Policy Guidance. Initial attack responsibilities will be transferred to the IFSO Strike Team in FY 05, provided the strike team is fully funded and staffed.

2.4.5. Outside Agencies.

a. Unlike mainland wildfire operations where resources can be pulled from all over the country, resources in Hawaii are limited to those found on each island. However, there are several outside agencies that will assist the Army with wildfire suppression through mutual aid agreements. These agencies are:

1. City and County of Honolulu Fire Department, (Island of Oahu).

2. Hawaii County Fire Department, (Island of Hawaii).

3. State of Hawaii, Division of Forestry and Wildlife (DOFAW), (Island of Oahu and Hawaii).

4. National Park Service, Hawaii Volcanoes National Park, (Island of Hawaii).

5. U.S. Air Force at Hickam Air Force Base (AFB), (Island of Oahu).

b. Interagency agreements and/or cooperative agreements must be established and periodically reviewed for currency.

3.1. SETTING.

3.1.1. Location. The Hawaiian Islands occupy a position just south of the Tropic of Cancer at Latitude 23.5° North in the center of the Pacific Ocean. These volcanic islands have been weathered to various degrees and support a broad range of environments, from dry savannahs to wet tropical forest. The total land area of the principal islands is approximately 16,800 square kilometers (6,500 square miles).

3.1.2. Geography. There are over one hundred islands in the Hawaiian Island chain, however, there are eight principal islands. From west to east these are Niihau, Kauai, Oahu, Molokai, Maui, Lanai, Kahoolawe, and Hawaii. They are hilly or mountainous and about one-fourth of the land rises less than 200m (650 ft) from sea level, one-half lies between 200 and 600m (650 and 2,000 ft) in altitude, and another one-fourth reaches elevations of more than 600m (2,000 ft). Hawaii, the largest and most easterly of the islands, has peaks higher than 3,900m (13,000 ft), and active volcanoes. Coastlines are mostly rocky and rough. Only the islands of Oahu, Kauai, and Niihau have much in the order of coastal plains. Surface streams are few because the ground is composed of porous soils.

3.1.3. Climate. The prevailing northeast trade winds, ocean currents, and location near the equator maintain a tropical climate throughout the year. Temperature and precipitation remain nearly constant year-round at any given location, but both vary greatly with altitude and aspect. Average temperatures at sea level range from about 21° C (70° Fahrenheit (F)) in January to about 24° C (75° F) in July. Frost is rare below 1,200m (4,000 ft) and has never been recorded below 800m (2,500 ft). On the highest peaks, however, snow may fall any month of the year. Precipitation is heaviest on the windward side of all the islands, while leeward slopes can be semiarid. USARHAW lands are only on the Island of Oahu and Hawaii and their climatic range varies based on location.

a. Island of Oahu. The Army land on Oahu is scattered throughout the island. Oahu, unique among the other islands, consists of two mountain ranges that greatly influence the local climate. These are the Waianae Mountains on the west side of the island, and the Koolau Mountains on the eastern side. Although the Waianae Mountains are higher than the Koolau Mountains, they receive less rainfall. The Koolau's intercept the moisture-laden trade winds from the northeast, causing high rainfall over the mountain range's upper elevations. This creates a rain shadow and reduces the moisture available for precipitation in the Waianae Mountains. Annual rainfall in the Koolau's averages more than 5,100mm (200 inches). In contrast, Honolulu averages about 510mm (20 inches). The considerable range in annual rainfall and topography results in a diversity of vegetation types, fuel moisture, and relative humidities.

b. Island of Hawaii. The Army land on Hawaii (PTA) is in the central portion of the island and occupies much of the saddle area between Mauna Kea and Mauna Loa Mountains at roughly 2,630m (6500 ft) elevation. Temperatures are mild, with cool nights due to the high elevations. The annual mean temperature is about 15.6° C (60° F) at lower elevations at PTA and 10° C (50° F) at higher elevations. The area occupied by PTA is subject to occasional fog and frost, with frequent light rains in the winter months. The area is also subject to "vog", a local term used to describe foggy conditions due primarily to emissions of volcanic dust and ash. Winds tend to be gustier during the winter, while light winds continue in the dry summer months. Average annual rainfall ranges from 102 to 406mm (4 to 16 inches). Annual rainfall is variable because PTA is in the middle of a trade wind inversion zone between 2,023 to 2,832m (5,000 to

7,000 ft) in elevation. Even a 100-meter change in elevation can sometimes make a noticeable difference in atmospheric conditions. Average relative humidity is about 60-80 percent in windward areas below the inversion level and less than 40 percent above. With less than 41cm (16 inches) of rainfall annually throughout much of the area, there is always the potential danger of fire at PTA.

3.1.4. Flora. Native plants form a variety of community types, including grassland, shrubland, forestland, and areas of moss-lichen. Most shrubland lies in coastal lowlands on the lee sides of the mountains, extending to higher altitudes where rainfall is slight. Forests grow above the shrubland on the lee sides of mountains, extending to sea level on the windward sides. Shrubs mixed with scattered trees grow on the upper slopes of the high mountains, above the forest zone. Mosses and lichens grow above the timberline, where rainfall is low and frost is frequent. There are several types of native forestland, reflecting differences in availability of moisture. One occurs on the dry leeward sides of mountains up to about 800m (2,500 ft). Wetter areas up to about 1,800m (6,000 ft) support a forest that includes ohia, one of the dominant native forest trees in Hawaii, and treelike ferns. A third type of forest grows above the ohia up to 2,900m (9,500 ft) on Maui and Hawaii. The koa tree is the largest native tree on the islands, and can reach a height of 18m (60 feet) and a diameter of 3.7m (12 ft). Vegetation varies from wet rain forests to dry desert scrubs. These ecosystems harbor an abundance of threatened and endangered species, many of which are endemic to the Hawaiian Islands. Because of human activities, an influx of exotic species from around the world have taken hold in native Hawaiian ecosystems. Many of these aliens are highly aggressive invaders that easily outcompete native species for sunlight, nutrients, and water and they pose a serious threat to the continued viability of the native flora.

3.1.5. Fauna. Because of their isolation, the Hawaiian Islands feature a limited but unique selection of fauna. There are no native snakes and only a few reptiles and mammals. There are large populations of water birds such as terns, tropic birds, boobies, shearwaters, and petrels. Native forest birds include hawks, owls, crows, thrushes, flycatchers and honey creepers. Several bird species are presumed extinct and others are near extinction. Many species of animals have been introduced since human settlement including the axis deer, feral pigs, cattle, sheep, and goats.

3.2. REGULATORY REQUIREMENTS.

3.2.1. Endangered Species Act.

a. The Endangered Species Act (ESA) of 1973 requires all federal agencies to carry out programs for the conservation of endangered and threatened species. In addition, each agency shall insure that any action authorized, funded or carried out, is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. Endangered species have the highest biotic priority protection. If the candidate species is listed as federally endangered, threatened, or proposed for endangered or threatened status, the installation shall design and implement a management program that preserves and protects those species. A table of federally listed species is provided for each installation in Chapter 7. These species are shown in the Protected Resources map in each SOP.

b. Wildfire, as well as suppression and pre-suppression activities, can have significant deleterious effects on endangered species. Fire has both direct and indirect impacts on

endangered species. The direct effect is mostly considered negative, as it could kill the species. Indirect effects include destruction or modification of habitat and a change in the species composition.

c. As required by the ESA, the Army shall conduct Section 7 consultation with the USFWS on actions that may affect listed species. Most of the threats associated with military training are due to the risk of fire and invasion of weeds. Completion and implementation of the IWFMP is considered a necessary part of the consultation for each installation.

d. AR 200-3, Natural Resources-Land, Forest and Wildlife Management, prescribes current Army policies, procedures, and standards for the conservation, management, and restoration of land and the renewable natural resources consistent with and in support of military mission and in consonance with national policies.

3.2.2. National Historic Preservation Act.

a. Section 106 of the National Historic Preservation Act of 1966, as amended, requires installation commanders to identify, evaluate, and take into account the effects of undertakings on historic properties in accordance with the procedures outlined in 36 Code of Federal Regulations (CFR) Part 800. Section 106 also requires consultation with the State Historic Preservation Officer when an agency action may have an adverse impact on eligible and historic properties.

b. Cultural resources can be found in all of the FMAs. Structures and features representing heiaus, house platforms, stone walls of canoe sheds, pens, corrals, graves, shelter caves, petroglyphs, paved trails, and agricultural areas are abundant. Most are constructed of basalt cobbles and boulders. Fires of low intensity and short duration are characteristic of grassy fuels that dominate the training areas and usually do not affect these resources. Fire suppression activities, especially bulldozer lines and to a lesser degree, hand lines, can severely damage cultural resources. However, fire can remove vegetation that would otherwise obscure cultural resources, thereby benefiting the cultural resource program. Specifics for each installation can be found in Chapter 7.

c. AR 200-4, Cultural Resources Management, prescribes Army policies, procedures, and responsibilities for meeting cultural resource compliance and management requirements. These policies are designed to ensure that Army installations make informed decisions regarding cultural resources under their control in compliance with public laws, in support of the military mission, and consistent with sound principles of cultural resource management.

3.2.3. Clean Air Act.

a. As a federal entity, USARHAW is subject to all of the applicable regulations included in the Clean Air Act. Wildfires do not fall under Clean Air Act regulations as they are considered an emergency situation, however, all other fire management actions are subject to the law. This includes emissions from prescribed fires, though there are exemptions available if the prescribed fire is being used to abate a fire hazard.

b. Sensitive receptors of poor quality air from USARHAW lands are many on Oahu due to the high population density. Because of its location far from most population centers, PTA has few sensitive receptors within a reasonable distance.

3.3. RESOURCE MANAGEMENT PROGRAMS.

3.3.1. Natural/Cultural Resource Management.

a. The Directorate of Public Works (DPW) Environmental Division, Conservation Section, administers the conservation program that protects the endangered species and historical sites on the installation. One of the primary wildfire protection priorities is installation natural and cultural resources. It is necessary to integrate fire and natural/cultural resource management planning with military preparedness and training.

b. All fire preplanning efforts must consider what impacts fire pre-suppression and suppression activities will have on the natural/cultural resources they are designed to protect. Fire fighting strategies must minimize impacts to rare and endangered species, cultural resources, and other resources (e.g. habitat, watersheds, historical and archaeological sites, etc.).

c. The DPW Environmental Division, Conservation Section staff can be of assistance to a fire manager by providing input for developing acceptable fire containment or control strategies to suppress wildfires while still maintaining the health of the overall resource(s). This natural/cultural resource coordination must take place during any fire planning, preparations, and fire suppression operations. During extended attack suppression activities, Natural/Cultural Resource staff should be members of an Incident Command (IC) team staff.

3.3.2. Integrated Natural/Cultural Resource Management Plans (INRMP/ICRMP).

a. The purpose of the INRMP is to ensure that natural resource conservation measures and Army activities on mission land are integrated and are consistent with federal stewardship responsibilities. Fire suppression forces must be aware of the locations of high value natural resources and avoid damage during fire suppression activities.

b. The ICRMP is the installation commander's decision document for cultural resources management actions and specific compliance procedures. ICRMPs are internal Army compliance and management plans that integrate the installation cultural resources program with ongoing mission activities, identify potential conflicts between the two actions and compliance actions necessary to maintain mission essential properties and acreage's.

c. A completed INRMP and a draft ICRMP are available for Oahu and the Big Island.

3.3.3. Ecosystem Management Plan.

a. The Environmental Office has recently completed an Ecosystem Management Plan (EMP) Report for Army areas in Hawaii. Through these efforts, the Army in Hawaii is attempting to achieve the delicate balance between training requirements and responsible land stewardship. Biological Sensitive Areas (BSAs) and Sensitive Ecological Areas (SEAs) have been designated (see Chapter 7 for individual installation details) and how units will interact with these has been outlined in the EMP. These BSA/SEA are one factor used to determine priority protection areas in the FMAs.

b. BSA's "depict areas with rare and/or endangered species. Training limitations are imposed on BSA-1 and BSA-2 areas, or those with the highest native natural resource value"

(USAG-HI 1998). "These are highest priority sites for management, encompassing high elevation summit areas and higher quality communities at lower elevations" (25th ID(L) 2001).

c. SEA's "are areas designated for resource protection and subject to...training guidelines... Sensitive Ecological Areas combine protection of both natural and cultural resources, i.e., BSA-1, BSA-2, and Archaeological Management Areas" (USAG-HI 1998).

3.3.4. Integrated Training Area Management (ITAM).

a. The Integrated Training Area Management (ITAM) program provides a decision-making process and an action-oriented land management program to integrate Army training and other mission requirements for land use with sound natural resource principles. The program's goal is to achieve optimum, sustainable use of training lands by implementing a uniform ITAM program which includes inventorying and monitoring land condition, integrating training requirements with land capacity, educating land users to minimize adverse impacts, and providing for land rehabilitation and maintenance.

b. The ITAM coordinator and the wildland fire program manager shall collaborate to develop a broad-based monitoring and research program that tracks the results of fire management actions and post-fire land condition trends. Some of the specific areas outlined in the ITAM program are revegetation and firing point rehabilitation projects, soil erosion control, monitoring of existing transects, vegetation surveys and troop environmental awareness programs. The ITAM program also plays an integral role and complements the wildfire program by providing assistance in planning post-fire restoration, rehabilitation, and revegetation of training areas when impacted by fires.

c. ITAM manages the GIS system and database in support of range operations, Land Rehabilitation and Management (LRAM), Land Condition Trend Analysis (LRAM), and Training Requirements Integration (TRI). GIS based programs are being developed and implemented as an integral part of the Army's wildland fire management program. Fire managers are increasingly relying on GIS as another tool to assist in the problem solving process and in making critical decisions. By putting spatial data in an integrated system where it can be organized, analyzed, and mapped, users will be able to find patterns and relationships that were previously unrecognized. This in turn will give fire managers a better understanding of the problems associated with wildfires and take action to prevent fires caused by military training activities.

3.4. FIRE EFFECTS.

3.4.1. Fire Ecology. It is not the intent of this plan to determine the effects of fire on the native ecosystem on Army land. The ecosystem is not fire dependent and any fire in the ecosystem is considered detrimental to the sensitive balance found on Army land (except for limited prescribed burning of alien grasses for fuel load reduction).

3.4.2. Vegetation Effects. Of the ecological communities, shrublands and grasslands contribute most to the fire problem. Fire is a major threat to native taxa and natural communities in Hawaii. Few native Hawaiian plants and animals are adapted to wildfires, and none has been found to be dependent on fire for survival. Consequently, most native plants and animals perish during fires. Little is known about subsequent recovery. Fire is also a major disturbance that accelerates the conversion of native-dominated communities to alien-

dominated ones. Fire destroys the native components, allowing aggressive alien species to become established. Fire can destroy native taxa directly, and degrade their habitat. Adapted to a low fire occurrence, native plants sometimes recover, but typically not to pre-burn levels when in competition with fire stimulated alien grasses.

3.4.3. Role of Fire. The ecological role of fire in Hawaii is consistent with other tropical areas, where fire, usually of anthropogenic origin, converts tropical forest to savanna and grassland. Pyrophytic grasses typically invade burned sites, thus rendering them more fire prone. Subsequent burns inhibit the reestablishment of tree species and intensify alien grasses and fuel problems. The view of ecologists in Hawaii is that natural fire was not a significant ecological or evolutionary factor before the introduction of humans and alien vegetation. Alien bunch grasses and matted perennials accumulate litter and have considerable dead foliage attached. They are highly fire tolerant and occur in high fire frequency regimes in their natural ranges. All re-sprout vigorously and establish from seed after fire. These non-native grasses have a higher moisture of extinction and are adapted to burn in high tropical humidities and carry fire under essentially all conditions except sustained rain. Most of the grasses originate in seasonal tropical, subtropical, or warm and humid temperate areas where they can burn under high relative humidities. Some foliage produces an oil that seems to increase flammability.

3.5. FUELS.

3.5.1. General Wildfire Fuels.

a. Vegetation is the fuel for any wildfire. Petroleum based fuels, wood products, and plastics that are associated with human development are normally not found in the FMAs. Structural facilities in training areas are addressed under structural fire protection programs. All vegetation is either already a fuel source or is a potential fuel source under specific conditions. The dry dead foliage, or litter, produced by all vegetation creates fuel for fire. Living vegetation becomes a viable fuel source when drought conditions dry the living plants sufficiently or when, during a wildfire, they are dried by the convective or radiant heat of the fire itself.

b. Fuel conditions are directly related to moisture patterns and seasonal rainfall. During short periods of no or low moisture, the burning potential of vegetation can persist throughout the year. Fluctuations in precipitation can also result in short periods of vegetation green up followed by periods of drying. Dry conditions contribute to an increase in dead foliage and litter in plant communities. The invasion of alien vegetation has altered native ecosystems dramatically, increasing fuels and making many sites prone to damaging wildfire. Invasive, fire prone grasses have modified the natural regime and as a result, fire promotes the degradation of the remaining native Hawaiian ecosystems. The spread and intensification of alien grasses increase the frequency and extent of fires. Specific vegetation/fuel types are described under each FMA SOP and Chapter 7.

3.5.2. Fuels Classification.

a. Fuels are a combination of the dead vegetative litter, dry or flammable standing foliage, and the live vegetation that can be dried and become a fire fuel. Fuels can be defined as the portion of the biomass, which is likely to burn if ignited.

b. Fuels are broken down into classes described by the amount of time or “time lag” that is required to change the moisture content of the individual fuel particle being classified. This time lag is the amount of time for a substance to lose or gain approximately two-thirds of the moisture above or below its equilibrium moisture content. The shorter the time lag the more responsive the fuels are to changes in environmental moisture.

c. There are four classifications. One-hour fuels consist of dead vegetation less than ¼ inch in diameter, the 10-hour fuel class is 1/4" to 1" diameter, 100-hour fuel class is 1” to 3" diameter, and the 1000-hour fuel class is 3” to 10” or larger diameter. Estimated behavior models for each FMA are discussed in Chapter 7.

d. The 1-hour classes of fuels are considered to be "fine fuels" and the most sensitive to ignitions. Calculation of the current moisture content of the fine or 1-hour fuels is based on weather conditions. These calculations are used to monitor the level of flammability of the fine fuels based on the amount of moisture they are estimated to contain. Careful monitoring of the estimated Fine Fuel Moisture (FFM) level will provide an accurate indication of fuel combustibility. It should be noted that these moisture percentages can change rapidly (within minutes) depending upon temperature and relative humidity readings. In fuel types dominated by 1-hour fuels, fine fuels become the most critical concern of a fire manager. This size class reacts rapidly to changes in weather conditions, and is the primary carrier of fire, especially in wind driven conditions.

3.5.3. Fuel Types.

a. Many plant communities have similar fuel classification characteristics. These plant communities are grouped into fuel types.

b. Plant communities were recently mapped using digital geospatial data for the Island of Oahu by the Kennaway *et al.* (Plant Community Mapping, Military Lands, U.S. Army Hawaii, Oahu. Center for Environmental Management of Military Lands. 2003). Fuels at PTA were previously mapped in a study by Shaw and Castillo (Plant Communities of Pohakuloa Training Area, Hawaii. Center for Ecological Management of Military Lands.1997). The plant community maps produced by these studies were grouped into fuel types for use in wildland fire management. These types have also been correlated, to the degree possible, with the 13 standard Northern Forest Fire Laboratory (NFFL) fuel models. In addition two custom fuel models have been developed for particular Hawaiian fuels. These maps are located in Chapter 7.

c. Vegetation at PTA is quite different from that found on Oahu and is addressed separately in a section devoted to fuels at PTA (see Section 7.6.2). The fuel type classifications on Oahu are presented below with their associated NFFL fuel model.

(1) Short Alien Grassland. These are comprised mostly or entirely of yellow bluestem/broomsedge bluestem (*Andropogon virginicus*) grasslands. Some shrubs may be present, but they are sparse and the primary fuel is the grasses.

NFFL Fuel Model 2

(2) Tall Alien Grassland. Grasslands that are dominated by guinea grass (*Panicum Maximum*), molasses grass (*Melinis minutiflora*), or a combination of these grasses are denoted

by this fuel type. Shrubs such as haole koa (*Leucaena leucocephala*) may be present as part of the fuel bed, but the grasses are the main component. This is the primary fuel of concern on Oahu and has received considerable scientific scrutiny. Because fires in this fuel type do not conform to predictions made by any of the NFFL models, a custom fuel model has been developed and validated to represent fires in these grasses. Though the model was built and validated using data from guinea grass, it is believed that it will work better than any of the NFFL models in molasses grass. These grasses often coexist, and domination of a specific site by either species is often in a constant state of flux. It is, therefore, not reasonable either to accurately map the separate locations of these species, nor to use a separate fuel model for each species. Thus a single fuel model will suffice.

Guinea Grass Custom Model

(3) Eucalyptus Forest. Another primary concern of fire managers on Oahu is the prevalence of various species of eucalyptus throughout USARHAW lands. These tall trees are fire prone and fire adapted and fires in stands of eucalyptus present a serious challenge to suppression crews if they get into the crowns of the trees. They also slough off large quantities of highly flammable bark that provide a fuel matrix conducive to the spread of fire. The understory may also be infested with guinea grass, though it is usually not dense enough to carry fire on its own. Paperbark eucalyptus (*Melaleuca quinquenervia*) is grouped into this category as well because of its physical features. As its common name suggests, it also produces flammable bark.

NFFL Fuel Model 10

(4) Ironwood Forest. *Casuarina spp.* sheds needles prolifically, producing a thick litter bed and duff layer. This fuel bed thick with fuels for fires and fires in ironwood stands can become intense.

NFFL Fuel Model 9

(5) Mixed Forest. This fuel type falls on the other end of the fire behavior spectrum from the grasslands and the eucalypts. Common species include O'hia (*Metrosideros polymorpha*), strawberry guava (*Psidium cattleianum*), and the shrub and herbaceous communities found on very steep slopes and cliffs. Fires tend to creep in the duff and surface litter and rarely flare up except under the driest and windiest conditions. Fuel moistures tend to be high, partly due to the high elevations, and associated higher rainfall, at which these communities are found.

NFFL Fuel Model 8

(6) Christmas Berry Shrublands. A major invader, Christmas berry (*Schinus terebinthifolius*) is found on most Oahu USARHAW installations in a variety of ecological settings. It tends to grow in pure or nearly pure stands, and produces very little fine fuel litter. It is this characteristic that results in fires of low intensity and spread rate. Under moderate conditions, fires may have difficulty crossing through even moderate size stands of Christmas berry, making these locations potentially strategic for suppression efforts.

NFFL Fuel Model 5

(7) Kukui Forest. *Aleurites moluccana* is almost always restricted to moist drainages and is, therefore, a good indicator of high moisture microclimates. Stands of this species may

represent boundaries that fires are unlikely to cross except under very dry conditions. Saturated areas, such as bogs, are also included in this fuel type. A custom fuel model has been developed to represent this fuel type based on eye witness accounts of fire behavior in kukui fuels. It has not been validated because kukui communities tend to be long and sinuous, rather than blocky, making prescribed burning difficult to impossible to use as a validation method.

Kukui Custom Fuel Model

(8) Developed/Denuded. Though technically not a fuel type, as there is little or nothing to burn, this is an important category because it represents existing barriers to fire. These may be locations where the vegetation has been removed through excessive use, or where urban development has created a fuel bed that is not prone to fire. Regardless of the reason, this fuel type represents locations that will not burn.

No Fuel Model

3.6. FIRE BEHAVIOR AND FUEL MODELS.

3.6.1. Fire Behavior. Fire behavior of the Hawaii fuel types are inadequately researched and documented for most fire management purposes. Insufficient fire behavior data from various fuel types make determining which of the standard fire behavior fuel models apply (1-13) difficult. Standard models may not apply to all Hawaii fuel types because fuel bed characteristics differ from those on which the standard fuel models are based. The native vegetation types have a low rate of spread and low intensities with occasional increases in the intensities when the fire burns into the 100-hour (1” to 3”) and the 1000-hour (3” to 10”) fuel class. Most species will carry fire at dead fuel moisture as high as 20-25% and relative humidities as high as 85-90%. Significant progress has been made in predicting fire behavior in the guinea grass (*Panicum maximum*) dominated grasslands which are abundant on Oahu. A custom fuel model has been developed and validated that accurately portrays fire behavior within that fuel type (Beavers 2001). Further fuel model development is necessary, particularly for the grassy species of PTA, most notably the invasive fountaingrass (*Melinis minutiflora*).

3.6.2. Fuel Models.

a. Standard fire behavior fuel models have been assigned to the various plant communities occurring throughout USARHAW lands. In addition, two custom fuel models are applied to vegetation which is not well represented by the standard models. Factors in the fire behavior fuel models are fuel loading in each time lag class, fuel bed depth, the surface area to volume ratio, the heat content of the fuel, and the extinction moisture. Fuel depth can be critical to fire behavior determination and is very important in the grass fuel types of Hawaii. Very deep grasses will permit the highest wildfire intensities, although not necessarily the most rapid fire spread rates. Seasonal changes in the amount of live biomass for perennial and annual species are very important to potential fire behavior. Grass fuel beds composed entirely of green material (e.g. an immediate post-fire stand of grasses) are difficult to burn. However, green grass can be “under burned” where the fire carries in a well-developed thatch layer when relative humidities and soil moistures are low. A vegetation map of all USARHAW installations has recently been completed and the vegetation communities represented therein have been reclassified into these standard and custom fuel models to visually depict the lay of the fuels on the landscape. See Chapter 7 for fuel models that apply to specific installations.

b. In addition to fire behavior fuel models, National Fire Danger Rating System fuel models have been assigned to each installation to aid in determining the threat of fire given the current weather conditions. The NFDRS provides an estimate of the risk a fire would present, should one be ignited. See the installation SOP's for specifics.

c. Fuels have been mapped to give spatial information on their distribution. Specifics for each installation can be found in Chapter 7.

3.7. FUEL LOAD.

a. Fuel load is described as the amount (weight) of flammable biomass that will buildup in a given area over time, or at a specific time. Fuel loading is normally measured in tons of biomass fuels per acre. Fuel loads in a given area can vary greatly depending on fuel types and environmental conditions, particularly soil moisture and soil quality.

b. Fuel loads are constantly in flux, and the more variable the vegetation type over time, the more difficult it is to assess the fuel conditions. Herbaceous fuels are the most difficult to estimate over time because they change so readily with alterations in climate. This problem is exacerbated in Hawaii due to the year round growing season.

c. Fuel loading is one of the primary factors in the fire behavior fuel models and the NFDRS fuel models. The DPW Environmental and the ITAM programs support the Wildfire Management program by providing continued vegetation surveys. These surveys will be used to the extent possible to monitor fuel conditions. However, most of these monitoring plots are located in native vegetation away from the primary training areas and are of little use in determining the condition of the lands on which ignitions are most likely to occur. Therefore it is necessary to regularly assess the fuel conditions in the primary training areas.

d. On USARHAW lands, grassland fuels (both annual and perennial) are the most common and are fairly homogenous compared to other fuel types. Grass and herbaceous fuels are fine structured, and thus have a high surface area to volume ratio that permits rapid responses in fuel moisture to changes in atmospheric moisture. Post-fire development to pre-burn levels of biomass occurs within several months to years, and is often higher than 10 tons/acre, very high for a grass fuelbed. The dead fuels also increases rapidly in this fuel type and contribute to fuel continuity at the ground surface. Estimates of fuel loading for critical FMAs can be found in Chapter 7.

3.8. FIRE HISTORY.

3.8.1. General History.

a. Non-human caused fires in Hawaii have always been uncommon due to a lack of ignition sources and the relatively moist environment that covers the majority of the islands (Mueller-Dombois 1981, Smith and Tunison 1992). Lightning is infrequent and is usually accompanied by precipitation, and dry lightning is extremely rare. Lava-ignited fires do not burn enough area in comparison to the area covered by the flow itself to be of any significance (Vogl 1969).

b. Human colonization brought with it the introduction of fire as an agricultural tool and as a side effect of other activities. Effects on most native plant species are not well understood, but anecdotal evidence suggests that areas that are disturbed by fire tend to be overwhelmed afterwards by highly aggressive non-native invaders. There are many possible reasons for this, though the most likely explanation is that the exotics have evolved in ecosystems in which they were surrounded by competitors, herbivores, and disturbance regimes that pressured them to develop characteristics that allow them to respond to fire with more vigor than species that have evolved in non-fire prone areas, such as the natives of Hawaii. The exotics are from highly competitive ecosystems that are subject to frequent fire and heavy grazing and therefore have developed a strong ability to resprout from belowground organs and/or germinate quickly from seed (Pyke 1987, Freifelder et al. 1998). When released into an environment in which many ecological niches are vacant or filled with comparatively poorly fire-adapted species, the exotics flourish.

3.8.2. Fire History on Army Lands. The entire Hawaiian ecosystem, including Army lands, has experienced an increase in fire frequency in the recent past. This is due to many factors, mostly the spread and intensification of alien grasses, and, on Army land, technological advances in ammunition and supporting pyrotechnic devices used for training. An attempt to reduce this frequency began in 1991, with the application of a fire prevention and prescribed burn program. Past fire history records for all training areas are sketchy and inconsistent, making an evaluation of the fire prevention program impossible. Most fire history files are incomplete and were primarily retained as manual records. These were destroyed following disposition of records (after 5 years) in accordance with the Modern Army Record Keeping System (MARKS). Fire history analyses, based on available records for each FMA, can be found in Chapter 7.

3.9. IGNITION SOURCES.

a. There are several sources of fire ignition on Army land. They are divided into three categories: natural, arson/accidental, and military activities. Most ignitions on Army land result from military activities. The Army experiences a high incidence of wildfires which cross all types of borders, be they political, ownership, land use, or vegetation type.

b. Natural ignition sources are rare in Hawaii. There is evidence of natural fires started around the state by lightning and volcanic activity. Because of climatic conditions and location, these occurrences are very rare on Army land. However, natural fires have started elsewhere and spread onto Army lands.

b. Arson and/or accidental fires occur occasionally on Army land. Ignitions from children playing with fire, smoking, power lines, and vehicles (which make up the majority of ignitions on most public lands) are only a small fraction of the total number of fire starts on Army land. Fireworks play an important part in the local culture. Many types of fireworks are legal and are used several times during the year. Deliberate arson occurs occasionally.

c. The military activities associated with training introduce the risk of unplanned fire ignitions with the use of ammunition and pyrotechnics. The principal ignition sources on Army land are tracers, pyrotechnics, illumination rounds, and explosive ordnance. The live ammunition and incendiary devices used on Army ranges during training provide ignition sources and cause numerous wildfires each year in the FMAs. These are by far the largest source of ignitions on the live-fire ranges.

4.1. PREVENTION.

4.1.1. Fire Prevention Program.

a. Fire prevention is the foundation of an effective fire management program. It includes all activities intended to reduce the number and severity of fires. Since the cost of preventing a wildfire is almost certainly less than the cost of suppressing it, fire prevention is one of the most cost-effective fire management activities available to the Army. An accurate determination of fire causes, as they occur within each FMA, provides a statistical basis for establishing fire prevention priorities. To be most effective, the Army's wildfire prevention program must use the cause data to identify ways to prevent fires or reduce the severity of fires within each installation.

b. Fires ignitions on Army training lands are inevitable due to the availability of fuels and the nature of military training. The key to the Army's success in minimizing the impact of these fires is to initiate an aggressive fire prevention program to reduce the number of fire starts and to reduce the impact of those fires that do start.

c. The first step in this planning process is to identify the risks and hazards that exist within each training area. An analysis of all available fire history data for trends in fire frequency, fire cause, fire size and associated weather, topographic, and training conditions may uncover important common denominators that can then be controlled to reduce fire impacts. Existing and projected levels of training use by the Army and other DOD components represent an elevated risk of wildfire as compared to civilian land uses. Any increase in live-fire exercises, access, or the number of troops maneuvering in high hazard vegetative fuel areas will escalate this risk.

d. Wildland fire prevention actions will generally fall into one of the following categories; education, engineering, ignition control, or enforcement. Each component represents a different approach to the common goal of reducing the number and severity of fires within each installation. It is imperative that the different departments of USARHAW, particularly trainers, soldiers and officers, the natural and cultural resource managers, the fire and emergency services personnel, and Range Division, clearly understand their roles and the importance of each component.

4.1.2. Education. All commanders, directors, natural/cultural resource managers, and fire managers have a role in developing fire prevention orientation and training programs to educate the users of USARHAW lands. In coordination with Range Control and resource protection managers, fire prevention orientation and training programs will be designed and implemented to explain wildfire ignition potentials, probability of escape, impact on natural resources, and the threat to high value areas within and outside of each installation.

a. Signage. Signs are an important visual reminder for individuals and groups using the training lands. Posting of fire prevention signs throughout the training ranges also enhances awareness. Fire prevention signs stating "Only You Can Prevent Range Fires!" or "Do You Know the Current Fire Danger Rating?" and/or "Do You Know the Current Training Restrictions?" strategically placed at clearly visible points along major travel ways help increase fire prevention awareness.

b. Instruction. A portion of all classes that cover the uses of Army land will address the importance of fire avoidance and actions to be taken when fires are detected. Examples of current classes are:

(1) Environmental classes such as Environmental Compliance Officer (ECO).

(2) ITAM Environmental Awareness (EA) courses during Range Officer in Charge/Range Safety Officer (OIC/RSO) classes.

(3) General instructional courses such as the commander's course and range/training area in-briefings.

c. Informational materials. Fire prevention messages can also be placed in already existing information media, publications, and on durable pocket cards that are issued to users to increase individual awareness on other subjects. Examples are:

(1) DPW Environmental videos, newsletters, updates, web sites, and hand out cards/brochures.

(2) ITAM Environmental Awareness videos (Sustainable Range Awareness), newsletters, updates, web sites, and hand out cards/brochures.

(3) Range and training area SOPs.

d. Briefings. Prior to commencement of training exercises, all units will be briefed about fire prevention requirements for the particular training area they are using. Briefings tailored to each FMA are included in the installation SOPs in Appendix 1.

4.1.3. Enforcement. Enforcement is a very important component of an effective fire prevention program.

a. Enforcers of wildfire prevention are:

(1) Range control (Range Division-Hawaii) safety staff. The Range Control (Operations) staff has the responsibility for ensuring that all regulations and SOPs are adhered to in accordance with 25th ID(L) and USARHAW Reg. 210-6 and 25th ID(L) Training Reg. 350-1. Range control has authority to stop live-fire training for noncompliance with any regulation or SOP.

(2) Land management staff. Range Division range inspectors, maintenance, ITAM personnel, DPW Environmental, Real Estate and Grounds staff have the responsibility to report fires and/or any observed noncompliance with fire prevention procedures to Range Division safety staff.

(3) Fire management personnel.

(4) Law enforcement personnel (Military Police, and game wardens).

(5) All commanders, their staff, directors and supervisors/leaders at all levels.

b. Commanders and managers must be aware and involved in fire prevention to ensure compliance with the requirements of the Wildfire Management Program.

c. Existing military training regulations and SOPs cover training activities and restrictions based on specific fire danger ratings. However, communication and enforcement of these restrictions even at the lowest levels is necessary to make them effective. Supervising personnel will be held accountable for knowing and implementing these restrictions. Range control managers and safety technicians who manage the training areas are also accountable.

d. Public laws, Army Regulations, the Commanding General's command policies/guidance, and range directives outline individual responsibilities and accountabilities for enforcement of fire restrictions and implementation of the IWFMP. This information must be passed along by the commander and supervisor and discussed in training sessions given to individuals using Army land. In order to effectively control ignitions to the maximum extent possible, the installation must ensure that the necessary precautions are followed and that there is strict enforcement and accountability for violations. Though the burden for enforcement will largely fall upon Range Control, it is ultimately the responsibility of all users of USARHAW lands to prevent fires and enforce fire prevention regulations.

e. Wildland fire prevention is similar to personnel safety – everyone has a responsibility to prevent its occurrence. All personnel must know and understand the fire prevention procedures.

4.1.4. Engineering. Engineering involves the alteration of a range design/alignment or a physically disrupting the fuels to reduce the likelihood of a fire starting or to reduce its effects if one does start. This can be accomplished by eliminating fire causes biologically, mechanically or chemically through reduction of available fuel loads, improving access for fire apparatus, increasing water resources available on site, adjusting target placement, and providing buffer or safety zones.

a. Engineering activities include the construction of fuelbreaks and firebreaks and recognized fuel modification programs (i.e., prescribed burns, mechanical/chemical treatments, mowing, and livestock grazing) to minimize the threat of fires. Engineering activities will be coordinated among all the Army's land and fire managers to include appropriate National Environmental Policy Act (NEPA) documentation, and Section 7 and Section 106 consultation, as required.

b. Coordination is essential as engineering activities may result in restricted operations and total or partial closure of the training ranges. A work plan, identifying engineering projects by priority, will be developed. This process will ensure that engineering projects can be completed and will eliminate any conflicts between the required maintenance of the ranges and military training activities. The Range Planner and the Wildland Fire Program Manager shall collaborate to develop an annul work plan facilitating maintenance of all required wildland fire infrastructure.

4.1.5. Ignition Control. The Army must make special considerations for controlling the use of classes of ammunition and pyrotechnics that have higher fire hazards associated with their use. By developing a fire danger rating system for each FMA, wildfire ignitions can be limited and controlled. These ratings depend on weather conditions and let training unit commanders and fire managers know when the potential of wildfire ignition exists. This allows modifications to training tasks that reduce the risk of a wildfire. Specific munitions may be allowed at one level but restricted or forbidden at a higher level. Munitions that are more fire prone are more strictly

controlled than those that pose little ignition risk. Further discussion on ignition control as related to fire danger ratings can be found in paragraph 4.2.5. below and for each FMA in the appropriate SOP.

4.2. PRE-SUPPRESSION PLANNING.

Effective pre-suppression planning will enable fire managers to easily and efficiently meet the objectives of this IWFMP. Experience and prediction allows fire managers to determine the greatest likelihood of a fire ignition in time and space. Having the right resources at the right place will enable a quick and effective initial attack. As the fire danger increases, the level of preparedness must increase. While both pre-suppression planning and fire prevention fall under
the term pre-suppression, pre-suppression planning focuses on identifying and acquiring the resources needed to suppress anticipated fires once they start, while fire prevention focuses on preventing fires from starting in the first place. Pre-suppression planning is work done before fire occurrence to ensure timely and effective suppression. It is based on the analysis of data to develop strategies that are most effectively use pre-suppression, fuels management, and suppression capabilities to meet management objectives.

4.2.1. Personnel Safety. Public and firefighter safety is the first and highest priority. Safety is the responsibility of everyone assigned to a wildfire incident. Safety is an attitude that must be promoted at all operational levels. Once personnel are committed to an incident, those resources become the highest value to be protected.

a. Fighting wildfires is inherently dangerous, and firefighters risk injury or even death in these operations. Nationally, there are wildland firefighter fatalities nearly every year. In addition to the danger from the fire itself, the need to use cutting tools, mobile apparatus, heavy equipment, and aircraft add to the risk involved. If firefighters know how to recognize potentially hazardous situations and how to mitigate them, they can reduce or eliminate much of that risk.

b. The training program and the qualification and certification process are the foundations of the safety program. Only qualified personnel will be assigned fire fighting duties. All assigned wildland fire personnel, whether on wildfires or prescribed fires, must meet National Wildfire Coordinating Group (NWCG) training standards. All personnel engaged in actual fireline operations (in the vicinity of the fire) must have completed, S-110 Basic Fire Suppression Orientation; S-130, Firefighter Training; S-190, Introduction to Fire Behavior, Your Fire Shelter, and Standards for Survival; and I-100, Introduction to Incident Command System (ICS). All trained personnel will be required to complete an annual four-hour refresher course. All personnel will have NWCG certified training for tasks they are assigned (see Section 4.6).

c. The Incident Commander must ensure that safety briefings occur at all operational levels. The identification and location of escape routes and safety zones will be stressed at every briefing.

d. All fire suppression actions must be in compliance with Army Regulation (AR) 420-90, Fire Protection, and the NWCG “10 Standard Fire Orders” and “18 Watch Out Situations”. A copy of the Fire Orders, Watch Out Situations, and list of mandatory Personal Protective Equipment (PPE) is listed in Reference 4.2.2 of this fire management plan.

e. It is mandatory that all fire fighting personnel assigned be equipped with the proper PPE necessary for fighting wildfires. Wildland firefighters must be intimately familiar with the tools used and PPE worn. Knowledge of proper selection, use, and care of the various tools used in Wildland fire fighting aids firefighters in performing their job as efficiently and effectively as possible. Likewise, knowledge of the proper donning, care, capabilities, and limitations of PPE, gives firefighters a better sense of which situations are tenable and which are not. Fire fighting personnel will ensure that proper PPE is worn at all times when actively engaged in fire fighting duties.

4.2.2. Minimum Staffing Requirements.

a. Fire Departments. The PTA Fire Department and FFD shall ensure that proper staffing requirements are in accordance with Department of Defense Instruction (DODI) 6055.6, Fire Protection Program, and established manpower-staffing standards. Having a fully qualified and trained fire fighting staff is an essential part of an effective suppression program.

c. IFSO, Strike Team. The IFSO will acquire a ten person strike team to take over the task of initial attack. This is currently handled by Range Control personnel who are trained for fire fighting, but whose primary duties may conflict with fire fighting efforts. In order to remove this burden from Range Division and to give the IFSO Wildland Fire Program Manager direct oversight of fire fighting personnel, the IFSO will procure funding for this strike team starting in FY 05. This strike team will provide services beyond initial attack, including providing labor for fuels management, firebreak and fuelbreak maintenance, and other labor intensive tasks; maintenance of RAWS; upkeep of fire fighting equipment including bambi buckets, hummers, and water tenders; and other tasks determined at the discretion of the Wildland Fire Program Manager.

b. USARHAW will staff levels of qualified Range Control personnel required to respond safely to wildfires at each FMA. Upper level (300-500 training level) fire manager positions will normally be Civil Service, not military, to provide work continuity and experience. Minimum staffing is based on the safety and complexity of the fire fighting organization during initial attack and extended attack operations. The Range Officer and Range Operations Supervisor will arrange work schedules to allow flexibility while ensuring that minimum staffing levels are met to include overtime authorizations as required. In the event of a fire, fire fighting duties take precedence over other work assignments. Minimum staffing levels at FMAs are addressed in each FMA SOP and Section 5.8.2.

c. Range Division Hawaii. The RDH shall ensure that proper staffing levels are maintained as required at each FMA. As first responders, qualified Range Control/maintenance personnel will provide initial attack and augment the FFD during extended attack operations. Based on the safety and complexity of the fire fighting organization during initial attack and extended attack operations, minimum staffing levels required on response fire vehicles in support of fire suppression operations are as follows:

(1) Brush Engine (HUMMER) 2

(2) Water Tender 1

c. Fire Management Areas. Minimum staffing levels vary at each FMA and shall be based on the size and scope of military training activities authorized at each training area. The

Schofield Barracks East Range, Kahuku Training Area, Kawailoa Training Area and Dillingham Training Areas are restricted to blank ammunition and limited pyrotechnics. Not all FMA's are manned by Range Control personnel to provide initial attack operations. However, the use of military units training in the area and closest forces, i.e., the nearest available appropriate resources (City/County) to respond to an incident at a specific FMA, must be covered by cooperative agreements or memorandum of understanding with adjacent agencies or fire protection organizations. The RDH will ensure that the following minimum staffing levels are available during live-fire training exercises at each FMA:

(1) Schofield Barracks: 3*

(2) Makua Military Reservation: 5*

(3) Pohakuloa Training Area: 3*

(4) Kahuku Training Area 3* * Includes Radio Dispatcher

4.2.3. Fire Equipment and Supplies. Caches of fire fighting equipment and supplies will be established and kept in a constant state of readiness for fire suppression.

a. The centralized fire cache facility is at Schofield Barracks. Satellite fire cache sites have been established at Makua Military Reservation, and Pohakuloa Training Area, and one will be established at Kahuku Training Area. The Schofield Barracks central fire cache facility will be equipped to outfit one hundred (100) firefighters with the appropriate PPE as described in the safety portion of this plan. Each fire cache will also maintain an appropriate supply of fire equipment as determined by the Wildland Fire Program Manager. It will be the responsibility of the Wildland Fire Program Manager (Oahu) and the PTA Wildland Fire Coordinator (PTA) to ensure that these caches are properly stocked. Lists of equipment in each fire cache are listed in Reference 4.2.1.

REFERENCE 4.2.1

Minimum Fire Cache Resources

Fire Cache Equipment	SB	MMR	KTA	PTA
Personal Protective Equipment (PPE)	100	40	40	100
Fire Hand Tools	60	40	40	60
Chain Saws	10	5	5	10
Fire Pumps (Portable or Slip-on)	6	2	2	6
Forestry Hose	2000'	1000'	1000'	2000'
Fire Buckets	3	2	0	3
Foam Proportioners	3	1	1	3
Foam Concentrate (5-gal pails)	180	100	40	180
Backpacks	40	20	20	40
Firing Devices (Drip Torches/Fuzees)	10	5	3	10
Fire Shelters	100	40	40	100
Portable Flexitank	2	1	1	2
MicroRAWS	2	1	0	1
Weather Belt Kits	10	4	4	10

b. Quantities are determined by potential manning for initial attack, with reserves, based on suppression requirements.

c. Each fire cache will be annually inventoried and inspected in order to ensure the equipment is ready to meet the objectives of this plan.

d. If at any time the required fire suppression equipment is not operational, live-fire training will be suspended until all equipment is operational. Live-fire training will only be conducted when fully trained/certified personnel and functioning equipment is readily available for fire suppression. This requirement pertains to all types of fire fighting equipment, water resources, and personnel. Any discrepancies shall be reported to the Wildland Fire Program Manager/PTA Wildland Fire Coordinator for immediate corrective action.

e. Wildfire Response Vehicles. The RDH shall ensure that fire response vehicles (Brush Engines or HUMMERS, and Water Tenders) assigned to specific FMA are available and operating in a constant state of readiness. If at any time the equipment on the fire vehicle is not operational, immediate notification must be initiated to higher authority to correct deficiencies. Priority for repairs shall be in accordance with Memorandum of Understanding between the G3/DPTM, RDH, DPW, DOL or contract services statement of work. The RDH shall maintain a minimum of two (2) HUMMERS at Schofield Barracks, Makua and Pohakuloa Training Area. One HUMMER will be the primary response vehicle while the other HUMMER serves as a reserve backup. Makua Military Reservation shall also be required to maintain a Water Tender as part of the initial attack response.

f. Personal Protective Equipment (PPE). It is mandatory that all fire fighting personnel assigned be equipped with proper PPE necessary for fighting wildfires. The Wildland Fire Program Manager shall maintain a minimum number of PPE at each fire cache facility to outfit all personnel assigned to support fire fighting activities. A list that outlines mandatory PPE for individuals engaged in fire fighting activities is provided in Reference 4.2.2.

REFERENCE 4.2.2
MANDATORY PERSONAL PROTECTIVE EQUIPMENT LIST FOR FIREFIGHTERS

Mandatory Personal Protective Equipment – Initial Attack

1. Hard hat w/ chin strap, Nomex face shroud
2. Eye Protection goggles
3. Nomex or Indura cotton shirt (or one piece jumpsuit)
4. Nomex or Indura cotton pants
5. Leather gloves
6. Fire shelter
7. 8” Leather boots, No steel toe

Line Gear

1. Fireline pack
2. Canteen (2 quarts minimum)
3. Ear plugs
4. First aid kit
5. File
6. 1 MRE
7. Headlamp with batteries
8. Flagging
9. Fuzees

4.2.4. Remote Automated Weather Stations (RAWS).

a. Weather is one of the most important factors influencing fire behavior. It is therefore critically important that fire managers be familiar with the seasonal weather patterns at each FMA. Microclimates can vary substantially within a FMA. Knowing what these differences are and when to expect them are essential parts of the pre-suppression planning process. Knowing how weather in the area behaves in the daytime, at night, and various times of the year can mean the difference between timely control of a fire and a long and costly campaign.

b. To obtain current weather data required to develop fire danger ratings, fixed RAWS have been installed at Schofield Barracks, Makua Military Reservation, Kahuku Training Area, East Range, and Pohakuloa Training Area. Portable Micro-RAWS units have also been procured to monitor real-time weather data during wildfires and prescribed fires. Future plans include the installation of at least one RAWS at Kawailoa, Dillingham, and Puu Pa on the Big Island. A RAWS will also be purchased for South Range Acquisition Area should it be purchased. The location and elevation of current RAWS sites in each specific FMA is provided in Reference 4.2.3 (See also the Resource Locations Figure in the appropriate SOP).

REFERENCE 4.2.3
REMOTE AUTOMATED WEATHER STATIONS (RAWS) SITE LOCATIONS

FMA	LOCATION	GOES ID	LATITUDE	LONGITUDE	ELEVATION
DMR (Proposed)	P1				
KLOA (Proposed)	Puu Kapu				
KTA	Range Control	325A861E	21° 40’ 45”	157° 59’ 22”	596’
MMR	Range Control	3266B468	21° 31’ 43”	158° 13’ 43”	20’
MMR	Ridge	3266C2F8	21° 32’ 34”	158° 11’ 56”	1750’
MMR	Portable	324C075A	21° 31’ 34”	158° 12’ 15”	520’
PTA	Range 8	3266D18E	19° 40’ 58”	155° 32’ 43”	6430’
PTA	West	32667176	19° 46’ 18”	155° 42” 08”	4290’
PTA	Kipuka Alala	32666200	19° 40’ 01”	155° 42’ 28”	5385’
PTA	Portable				
PTA (Proposed)	Puu Pa				
SBER	ER-6B	325AB384	21° 29’ 58”	157° 59’ 36”	1250’
SBMR	Range Control	3266A71E	21° 29’ 42”	158° 04’ 55”	980’
SBMR	Portable	3266E414	20° 30’ 35”	158° 04’ 58”	1138’

c. To provide the data necessary for computing FDRS indexes, the RAWS are equipped with automated sensors (rain gauge, wind speed/direction, air temperature, fuel temperature, relative humidity, solar radiation, and battery voltage). Batteries charged by solar panels power these electronically operated stations. Currently, data can be retrieved directly from a RAWS platform via local cable connection to a personal computer located at the Range Control or by Geostationary Operational Environmental Satellite (GOES) telemetry downlink operated by the BLM at the National Interagency Fire Center (NIFC) in Boise, Idaho. Here, the computer transfers the processed data and automatically calculates the fire danger indices. The RAWS data are available for each hour of the day and night, adding greatly to the general knowledge of weather affecting specific problem areas and to the general knowledge of local climatology. Individual authorized users with suitable computer terminal can access the stored data via commercial telephone connection through Internet access. The data is also archived so to facilitate development of a historical fire danger record necessary for fire trend analysis. Data

can also be shared with other local agencies (i.e., fire cooperators, weather service, etc.) within the State of Hawaii or elsewhere.

d. The daily weather data collected from these stations are used for a variety of purposes. The primary use has been for the National Fire Danger Rating System (NFDRS) calculations. The NFDRS is a system used by wildland fire management agencies to assess current fire danger at local levels. It consists of a variety of outputs (indexes) which portray current potential fire danger conditions. The indices are widely used in preparedness, suppression, and prescribed fire planning and implementation decisions. This system is the keystone of fire danger predictions and provides quantification of risk elements that are critical for fire management decisions including restrictions of military training activities.

e. Weather records have a key role in fire planning efforts. Fire planning is a continuous process. Most fire planning is based on five years of records including both fire weather and fire occurrence data. To date, the Army's database is incomplete and efforts are ongoing to compile enough data for effective fire planning.

f. A cooperative agreement between the BLM and the Army to provide a long-term technical and maintenance service is established. Implementation of this agreement benefits the Army by providing scheduled depot maintenance services and annual technical training to the Range Division maintenance technicians as first responders. Current Army initiatives include procurement of several new RAWS units for future installation at Kawailoa, Dillingham training areas and South Range Acquisition Area, should that land be purchased.

4.2.5. Cooperative Wildland Fire Fighting Resources. There are a number of agencies that cooperate with USARHAW to suppress fires. See Section 5.9 for more details. Hard copies of cooperative agreements with each agency are provided in Appendix 2.

4.2.6. Fire Danger Rating System (FDRS). Fire management planning requires reliable information about when and where fires may occur and what kind of behavior can be expected. A fire danger rating system provides basic fire planning data and guides wildfire management actions and preparedness. The FDRS warns firefighters and soldiers when dangerous conditions can be expected and thus determines preparedness and staffing levels. Specific information on the FDRS for each FMA can be found in the appropriate SOP.

a. A FDRS is established to provide a computer generated set of indices, based on current weather conditions, that forecast:

(1) An ignition component, which indicates the percentage of firebrands that will cause ignitions in light fuels.

(2) A spread component, which states how fast the head of a fire will spread.

(3) An energy release component (ERC), which estimates the amount of heat energy in BTU's produced by the flaming front.

(4) A burning index (BI), which estimates the effort necessary to contain a fire.

b. This information is used to determine the probability of a fire starting and the difficulty of control. With this information, a response can be planned which is appropriate for the expected fire behavior.

c. The Army's primary objective for developing a FDRS is to alert range operation managers, fire managers, and military training officers of the hourly fire danger and allow them to implement training restrictions associated with that rating. The Army uses the BI as its fire danger index at all FMAs (See Enclosure 4 of each SOP for specific FDRS's).

4.2.7. Fire Response Planning.

a. Fire planning is a continuing process. Most fire planning is based on five years of records including both fire weather and fire occurrence. The fire reporting system at USARHAW has been improved with the addition of the RAWS, which provide daily weather data collection, and WeatherPro™ software that automatically archives weather data that can be analyzed for fire planning purposes. Combining this information with fire occurrence data can improve the efficiency with which USARHAW can staff its response resources. Based on fire occurrence data and response time, fire managers can determine if existing fire control forces are adequate and if additional suppression forces will be needed.

b. Range Division-Hawaii can also determine if additional training restrictions need to be imposed as a result of unfavorable fire danger ratings or, conversely, if the FDRS restrictions are too tight. This kind of planning, based on experience with the fire danger, allows fire managers to fine tune the FDRS and associated restrictions over time.

c. FDRS data can also be worked into the ITAM Geographic Information Systems (GIS) computer database. By putting spatial data in an integrated system where it can be organized and analyzed, fire managers will be able to find patterns and relationships to increase efficiency in the decision making process. Response times, suppression success, and risk factors can all be combined to determine what locations and times require more or fewer suppression resources. In addition, fire managers need to analyze such things as the adequacy of detection to determine if fires are reported while they are small enough to control.

4.2.8. Pre-Suppression Priority

a. Wildfire prevention analyses are used to prioritize areas for wildfire pre-suppression funding and implementation. The first step is to split the installation into units based on existing and planned roads, fuel and firebreaks, or natural barriers to fire. Three factors are then considered to assess each unit for protection from wildfire: ignition potential, hazard, and value.

(1) Ignition potential is the likelihood that an ignition will occur that starts a fire and is often validated to the degree possible with fire history. It is based on the likelihood of an ignition source coming into contact with and igniting receptive fuels.

(2) Hazard is the degree of difficulty in controlling a fire that has been ignited in the given topography and fuels. Hazard, along with weather, is what determines whether a fire remains small or grows into a larger fire. Hazard also considers accessibility to the fire, since part of the difficulty in controlling a fire and part of limiting a potentially large fire to a small area is gaining access to it.

(3) Value is the importance or replacement cost of resources within the area. In the analyses in this IWFMP, values are almost exclusively threatened and endangered species.

b. Each area is assigned an ignition potential, hazard, and value of Low, Moderate, or High, based upon the best currently available information.

c. The ratings applied to each of the factors are subjective, however, they are rated relative to other units within the FMA. Experienced fire managers have a very good idea of where ignition potential and hazards are high or low within an FMA, and natural and cultural resource managers have a very good idea where the values are high or low. This expertise is used to rate each unit.

d. By assigning values of 0, 1, and 2 to the Low, Moderate, and High designations respectively, and adding the values for ignition potential, hazard, and value, a priority level for each pre-suppression area is determined. Specific pre-suppression priorities for individual installations and maps of pre-suppression priority areas can be found in Chapter 7.

4.3. FUELS MANAGEMENT.

All USARHAW land managers support the wildland fire pre-suppression program by assisting in providing strategies and resource allocation for fuels management, fuelbreak research, and firebreak road maintenance. A concerted effort between the Wildland Fire Program Manager, the ITAM Coordinator, the DPW Environmental Office, and the Range Facility Manager is imperative to the success of the pre-suppression program.

4.3.1. Fuelbreaks, Firebreaks, and Natural Barrier Systems.

a. The Army maintains a fuelbreak/firebreak system on installations at highest wildfire risk to minimize the spread of fires. If a wildfire escapes the initial attack, fuelbreaks and other fuel modification areas provide the most logical location for fire containment lines. Well maintained fuelbreaks and fuel modifications provide defensible space that aids in wildfire containment. Incorporating them into wildfire pre-suppression planning, initial attack responses, and resource deployment strategies can enhance the effectiveness of fire suppression. They also provide follow-up resources with a quick alternative attack strategy and a place to assemble that has been designated in advance and well documented and mapped. USARHAW specifications for fire/fuelbreaks are listed below. Information specific to each FMA can be found in Chapter 7.

b. Fuelbreaks.

(1) Fuelbreaks are defined as strategically located blocks or strips within which vegetation has been manipulated to reduce fuel volume or flammability as an aid to fire control. Fuelbreaks are most effective if they are linked to other natural or man-made fire containment barriers. Drivable fuelbreaks, or fuelbreaks that have periodic access are an important part of a successful fuelbreak system. Additionally, a fuelbreak system encompassing a large area is much more effective than an isolated single fuelbreak or small segments of fuelbreaks. Fuelbreak widths are determined by fuel type, terrain features, and expected fire weather conditions, especially wind direction and speed. Generally, the wider the fuelbreak, the higher probability and safer the task of containing the fire.

(2) Fuelbreaks may have a single ten foot strip of bare mineral soil or a mowed path located inside a wider brush cleared area to provide the most desirable containment line, however, this is not essential. This bare mineral soil can be maintained by disking or blading,

depending on environmental considerations. A road for all-wheel drive emergency vehicles should be provided within the fuelbreaks, though this is not absolutely necessary. This road does not have to be cleared of vegetation, provided the access route is mowed on an annual basis. On USARHAW lands, a firebreak is often combined with the fuelbreak to provide access and a stronger barrier to fire. Firebreaks are discussed in detail below.

(3) Fuelbreaks provide safe access for fire fighting personnel and equipment. Firefighters can be rapidly positioned along these predetermined fire control lines. The low volume fuels within the fuelbreak, can be fired out (black lined) quickly to further widen an existing firebreak or quickly create a new one under conditions where backfiring operations would be impossible in the adjacent dense vegetation. In situations where the vegetation within the fuelbreak is not too dense, the fuelbreak can be used to anchor a backfire, thus allowing a wide blackline to be established between the fire and the fuelbreak.

(4) Fuelbreaks normally will not stop the head of a fast spreading, high intensity wildfire that has the potential for long distance spotting. In this situation, the overall fuelbreak system aids firefighters in the containment of the flanks, rear of the wildfire, and/or reducing the size of the main fire front. If time permits, they may also provide a location from which to backfire, potentially slowing or stopping the advance of the main fire.

(5) Fuelbreaks will only remain effective if they are continually maintained. The condition of the fuelbreak and vehicle accessibility will be reviewed annually to determine necessary maintenance. Fuelbreaks shall be cleared at the end of the growing season, before the grasses dry and add to the dead fuel load in the area.

c. Firebreaks.

(1) Firebreaks are defined as cleared-to-mineral-soil fire control lines. Similar to fuelbreaks, to be effective, firebreaks must be maintained each year prior to potential use in fire control. Firebreaks in Hawaii will be 6 to 10 meters in width or more, but will sometimes be constrained by terrain.

(2) An annual preventive maintenance schedule for all designated firebreaks will be implemented. During construction and maintenance all berms and catpiles should be removed to the extent necessary to minimize erosion. Waterbars are to be installed at all natural watercourses on firebreaks, except where permanent drainage structures are provided.

d. Fuel Management Corridors and Natural Fire Barriers.

(1) Natural fire barriers (i.e., barren lava, rivers, streams, roads, etc.) can be used as a control line to stop the spread of fire. A natural barrier is defined as any area where a lack of flammable material obstructs the spread of wildfires. An indirect attack strategy may involve the withdrawal of fire suppression resources to roads, trails, and other natural fuelbreaks. The fuel between these barriers and the fire can be burned out or backfired if necessary.

(2) Fuel management corridors will be established at PTA only. These are designed around existing natural fire barriers that may become overgrown with vegetation in the future. The corridor is monitored for encroaching vegetation and management is initiated when it reaches a threshold level. Fuel management corridors are much wider than fuelbreaks but do not include any road infrastructure.

(3) Fuel management corridors are designed to slow or even stop a fire. At a minimum, they provide an area in which fire intensity is much lower than the surrounding vegetation, much the same as a fuelbreak.

4.3.2. Standards for USARHAW Fire and Fuelbreaks.

a. Fire and fuelbreak effectiveness in the event of a wildfire depends on regular maintenance. Standards will be adhered to wherever terrain permits. In some locations slope, drainages, or other factors may make these standards unreasonable. In these situations, the standards will be met to the greatest extent feasible. The following will apply to all firebreaks, fuelbreaks, and fuel management corridors on USARHAW lands:

(1) Firebreaks

(a) Firebreaks on Oahu will be no less than 6 meters in width of bare mineral soil. All vegetation will be removed from the firebreak, including overhanging branches from shrubs and trees, if possible. Depending on species, overstory trees on the perimeter of the firebreak may be left intact to reduce sunlight available to grassy fuels growing in the understory. This decision will be made on a case by case basis by the Wildland Fire Program Manager or other qualified individual.

(b) At PTA, firebreaks will be no less than 4.5 meters in width of bare mineral soil where they pass through grassy fuels, and no less than 9 meters in width of bare mineral soil where they pass through shrub or forest cover.

(c) All firebreaks will be maintained at least once per year. Firebreaks on Oahu will be maintained semi-annually should that be necessary to maintain a fuel free surface.

(2) Fuelbreaks

(a) Fuelbreaks will not be standardized for Oahu because of their limited use and the generally extreme topography which hampers their implementation. There are few locations where fuelbreaks of sufficient width can be emplaced to be considered effective deterrents to fire and there are no fuelbreaks planned on Oahu at this time.

(b) Fuelbreaks at PTA will be 25 meters wide where they pass through grass fuels and 45 meters wide where they pass through shrub or forest fuels.

(c) Fine fuels, such as grasses, and shrubs within fuelbreaks will be kept to less than 20% crown cover OR a maximum of one foot high. Generally speaking, fuels whose growth forms are based on clumps (e.g. bunch grasses) or stem growth (e.g. shrubs) will be limited via the 20% crown cover measure. Grasses that grow in mats or thickets, such as *Panicum maximum* (guinea grass) will be managed via the one foot height measurement. Tree species may be limbed to 2 meters high, rather than removed entirely, to reduce the impacts to sensitive ecosystems such as Palila Critical Habitat.

(d) Dead and cut fuels will be left where they fall except in cases where shrubs or trees are felled. In this case branches and limbs will either be removed from the fuelbreak entirely, scattered to a sufficient degree to meet the 20% crown cover requirement, or dragged to the outside of the fuelbreak away from the expected direction of the fire.

(e) Fuelbreaks will be monitored once annually. Ocular estimation will be used to determine crown cover and stubble height. Wherever fuelbreaks are not to standard, maintenance of the fuels will be implemented to reduce them.

(3) Fuel Management Corridors (PTA only)

(a) Fuel management corridors will be no less than 60 meters wide, and will ideally be 100 meters or more in width.

(b) Fuels within the corridor will be limited to the same specifications as in fuelbreaks (20% crown cover OR one foot in height).

(c) All of the corridors are located where there is little vegetation at this time. Because it is expected that fuel encroachment on these locations will slowly occur over the years, the fuel management corridors will be monitored once every 5 years. If fuels within the corridors form a continuous fuelbed outside of specifications that reaches across the corridor in any location, fuel management will be initiated. Fuels will only be managed where they are contiguous to reduce the impact of cutting and herbicide application on the native ecosystems.

(d) Once fuel management has been initiated for a particular fuel management corridor, that location will be monitored biannually thenceforth and maintained to comply with specifications.

Table 4.1
Minimum specifications for USARHAW fire and fuelbreaks

	PTA	*Oahu*	*Maintenance*	*Standard*
Firebreak	4.5 Meters (Grass) 9 Meters (Shrub or Forest)	6 Meters	Yearly	Bare Mineral Soil
Fuelbreak	25 Meters (Grass) 45 Meters (Shrub or Forest)	None Planned	Yearly	20% Crown Cover or One Foot High
Fuel Management Corridor	60 Meters	None Planned	Once every 5 Years until fuel reduction begins. Then biannually.	20% Crown Cover or One Foot High

b. Records of firebreak and fuelbreak maintenance will be kept on an ongoing basis.

(1) One record will be completed for each maintenance task (i.e. mowing CR-1).

(2) The records will include the date maintenance was initiated and completed, the location of the maintenance, the type and amount of fuel modification/removal used, the type and amount of herbicide applied.

(3) Each completed record will be given to the Wildland Fire Program Manager for storage.

4.3.3. Fuels Modification. Fuels modification is defined as removing and/or modifying an area or wide strip of flammable vegetation. Fuel modification can provide a reduction in radiant and convective heat, thereby providing fire suppression forces a safer area in which to fight the fire. Specific fuel management for each FMA can be found in Chapter 7.

a. Fire hazard is managed by changing the vegetation type. The goal is to maintain a fuel condition that makes fires easier to control. Maintenance treatments are necessary because the flammable biomass will grow back over time thus making fires more difficult to suppress.

b. The following methods, in order of decreasing effectiveness, are used to achieve lower fuel loading or a more manageable fuel matrix. A mixture of these techniques are often used in fuel management:

(1) Reduction. Reducing total amount of fuels so that there is not enough, or as much, to burn. Examples are prescribed burning, mechanical or chemical removal.

(2) Spacing. Manipulating the spacing of vegetation (both horizontally and vertically) so that it is difficult for fire to spread. Examples are mowing, grazing, or masticating.

(3) Moisture content. Reducing the flammability of fuels, by increasing the moisture of the vegetation or by changing the vegetation to less flammable species. This can be accomplished by watering, but this technique is only applicable for very small plots of land, such as around an individual house. More often this is accomplished by partially or totally replacing the fuels with fire resistant plants.

c. There are five categories of fuel modification treatments that can accomplish these objectives. In many situations, a combination of these treatments is applied:

(1) Prescribed burning reduces the volume of fuel through combustion. Fuel material can be ignited by hand or by mechanical devices at some distance from the site (i.e., helitorch, aerial firing device, etc.). Burning generally takes place when conditions permit adequate combustion as well as control. Prescribed burning is executed by qualified individuals under precise weather conditions and after extensive precautions are taken, such as installing firebreaks or control lines. The Army will initiate consultation with the U.S. Fish and Wildlife Service if any prescribed burning is planned to take place outside of firebreak roads. Prescribed burning is the fastest, most complete, and most cost-effective fuel removal treatment available. However, it generates many concerns over the chance of escape as well as air quality impacts. Coordination and notification of interested parties are major tasks. The Army has successfully conducted prescribed burns on Army training lands in the past. (Refer to Section 4.4, Prescribed Fire).

(2) Mechanical treatments rip up, bury, flail, or cut down vegetation and rearrange the fuel structure. Mechanical treatments generally involve the use of a bulldozer or tractor with a variety of attachments, such as a blade, large chain, rollers, a cutting (or pushing) blade, or a disker. These attachments scrape or break off the vegetation, beat up and crush or cut the fuel into small pieces, or bury the pieces. Mowing is the most commonly used mechanical treatment on USARHAW lands. It reduces the fuel height and thus reduces the intensity of a grass fire. Mowing is especially effective in increasing the ease of fire control if it takes place just inside the firebreak. Mowing is done by a tractor (usually with a rotary or flail mower attachment) in areas of grass and typically carried out by contract or range maintenance personnel. Hand labor is a subset of mechanical treatment, where human labor is used instead of mechanized equipment.

Its primary disadvantage is its labor cost, but in certain situations there is no other viable alternative.

(3) Chemicals such as herbicides and growth retardants can prevent seeds from germinating and kill mature fuels. Chemicals can be applied by hand, with a truck/tractor sprayer, or aerially. Vegetation is not removed, but further growth is stopped. Where plants are killed, the standing vegetation presents a temporarily increased fire hazard until the plant material decays. Thus, the fuel volume is not decreased immediately by this treatment, but will slowly be reduced by decomposition. It is essential that treatment frequency be high enough to prevent significant growth in the interim periods. Chemical treatments that reduce or prevent growth are most desirable. The choice of herbicides depends on the environmental setting, effectiveness on the vegetation in question, and the consequences for native species and human health and safety. While it can be an effective and efficient method, chemical control may not be appropriate in all settings.

(4) Biological treatments are the introduction of a biological control measure to counteract the undesired fuels. These measures can include the deliberate introduction of other plants or insects that will replace, modify or retard the undesired fuels.

(a) Simple. Simple biological treatments may be the introduction of fire resistant native or alien plants to out compete undesired fuels. Creating a vegetative fuelbreak is a common means of a simple biological treatment, though it is not an effective means of fire control in all situations. Another example is the introduction of a species of plant(s) to shade out or outcompete undesired fuels in a controlled area. Grazing is another form of a simple biological control. Livestock such as cattle, goats, horses, and sheep are most commonly used. It is only effective in non-forest fuels where the vegetation is palatable to livestock. The livestock consume the vegetation, thus keeping the amount of fuel in check. Goats prefer forbs and shrubs, but will also eat grass, whereas cattle and horses will eat primarily grass. Sheep will eat both forbs and grass. Steep slopes can be grazed by goats, sheep, and horses, but cattle prefer not to graze slopes over 30%, making them ineffective in mountainous terrain. Livestock control requires extensive enclosures and many times is not cost effective. Another disadvantage is animal escapes that result in damage to biologically sensitive areas.

(b) Complex. Complex biological measures involve organisms that will directly destroy the targeted vegetation. Normally these types of treatments are strictly implemented, monitored and tightly controlled and must be coordinated with multiple agencies because they involve the introduction of a non-native biological organism. There have been a number of disastrous complex biological treatments in Hawaii (e.g. mongoose to control rats), and because of possible unpredicted responses and potential damage to the native ecosystem, no complex biological treatments are planned on USARHAW lands for fire management.

d. The methods used in fuel modification, fuelbreaks, and firebreaks will vary due to terrain and acreage, and the shapes of areas to be treated.

e. Any removal or modification of native vegetation may be conducted only with the approval of the DPW Environmental Division, Conservation Section, following surveys to ensure that no endangered, threatened, or candidate species are in the area.

4.4. USE OF PRESCRIBED FIRE.

4.4.1. General.

a. Prescribed burning is defined as the controlled application of fire under specified environmental conditions that allow the fire to be confined to a predetermined area while at the same time producing fire behavior required to attain resource management objectives. Because of the potential for unintended circumstances, extensive planning, coordination, and risk management must be completed prior to ignition of any prescribed burn.

b. In the process of developing practical fuel reduction programs, fire managers will consider the use of prescribed fire. When applied in a safe, carefully controlled situation, it is often the most cost-effective means of achieving management and natural resource objectives. Consideration will be given to prescribed fire to protect habitats, natural resources, and capital improvements as well as reduce hazardous fuels, construct and reinforce fuelbreaks, and control alien plants. Well placed prescribed burning units can help prevent large wildfires or slow their advance.

c. Prescribed burning on Army training lands will only be executed by qualified individuals. A National Wildland Coordinating Group certified Prescribed Burn Boss must supervise all prescribed burns. The Burn Boss has the responsibility to make the on-site, tactical “go, no-go” decisions. The Burn Boss ensures all prescription, staffing, equipment, and other prescribed burn requirements are met before and during the burn.

d. Special considerations are necessary for any prescribed burn planned for Makua Military Reservation due to its ecological and cultural sensitivity. Because of the high resource value, additional restrictions have been developed and are included in the MMR SOP (See Appendix 1).

4.4.2. Objective.

Use management ignited or training ignited prescribed fires in a safe, carefully controlled, and cost-effective manner as means of achieving fire management objectives. Management ignited prescribed fires, often referred to as simply ‘prescribed fires’, are defined as intentionally set fires used to achieve a resource management objective. Training ignited prescribed fires are defined as fires that are unintentionally started during normal military training, but are allowed to burn to achieve a predetermined resource management objective. These are a special use, and are referred to throughout this document with their full name. Training ignited prescribed fires will be restricted to use within the impact area at SBMR and will be carefully planned and monitored. See Section 4.4.6(c) for further details.

4.4.3. Policy. The following policy statements apply to the use of prescribed fire on all U.S. Army Hawaii (USARHAW) managed training lands, regardless of the type of ignition:

a. A management ignited Prescribed Fire Burn Plan must be completed for all prescribed burning projects in advance of ignition.

b. A Training Ignited Prescribed Fire Burn Plan must be in place prior to any declaration of any training ignited fire as a Training Ignited Prescribed Fire (TIPF).

c. Prescribed Natural Fires are not considered in this document because there are very few naturally ignited fires in Hawaii. The lack of natural ignitions precludes a prescribed natural fire program.

d. In the Prescribed Fire/TIPF Burn Plan, address appropriate actions to take if onsite conditions change and cause one or more prescription parameters to exceed acceptable limits. A prescribed fire that exceeds, or is anticipated to exceed, one or more prescription parameters and/or line holding capability must be declared a wildfire and cannot be re-delegated as a prescribed fire. At this point, appropriate suppression action must be taken.

e. The U.S. Fish and Wildlife Service will be consulted before any prescribed fire is implemented.

f. Conduct each prescribed fire in compliance with the approved burned plan.

g. Use only trained and qualified personnel to execute each prescribed burn plan.

h. Base the number of resources required to safely achieve prescribed fire objectives on the size and complexity of each project. Minimum manning will vary with the size and complexity of each prescribed burn.

i. The IFSO Wildland Fire Program Manager must personally approve the Prescribed Fire/Prescribed Natural Fire Burn Plan and any changes. Only in the absence of the Wildland Fire Program Manager may this responsibility be re-delegated.

j. Other than the Wildland Fire Program Manager, the Burn Boss, Safety Officer, or appointee of the Wildland Fire Program Manager, has the authority to stop all firing.

4.4.4. Responsibilities.

a. United States Army Hawaii (USARHAW) shall:

1. Develop guidelines for the use of prescribed fire, including both management ignited and training ignited prescribed fires, in land and resource management planning within G3/DPTM, Range Division Hawaii sphere of influence.

2. Develop USARHAW standards for the preparation of Prescribed Fire/TIPF Burn Plans, including resource coordination, review, and approval by the appropriate line officer.

3. Approve all management plans that propose the use of prescribed fire from training ignitions.

4. Delegate Prescribed Fire/TIPF Burn Plan approval authority to the Wildland Fire Program Manager. Where appropriate, limit the approval authority to the Wildland Fire Program Manager, or in his absence, the designated acting.

5. Develop qualification standards for personnel involved in the prescribed fire program that meet or exceed NWCG standards.

6. Develop smoke management criteria for making "go/no go" decisions on use of prescribed fire from both management ignited and training ignited fires.

7. Develop a USARHAW process to:

(a) Coordinate workforce and equipment needs for prescribed fire and wildland suppression activities.

(b) Ensure that prescribed fire use and fire protection responsibilities do not exceed USARHAW capabilities and are coordinated with Command suppression needs.

(c) Annually monitor and evaluate the results of the TIPF program and provide copies of all reports to the USFWS for review.

b. Director, IFSO (Command Fire Marshall) shall:

1. Integrate the role and use of prescribed fire into G3/DPTM Range Division Plans.

2. Approve Prescribed Fire/TIPF Burn Plans. Where appropriate, delegate Prescribed Fire/TIPF Burn Plan approval authority to the Wildland Fire Program Manager based on the complexity of the prescribed fire proposal. Limit approval authority delegation to the Wildland Fire Program Manager, or in his absence, the designated acting.

3. Ensure that Prescribed Fire/TIPF Burn Plans and the personnel executing them meet minimum NWCG, DoD-wide, and Army Wildland Fire Policy requirements.

4.4.5. Prescribed Fire Ignitions.

a. Types of Ignitions. On USARHAW lands, two types of ignitions are recognized: Management ignition, resulting in a management (deliberate) ignited prescribed fire and training ignitions (lightning, lava), resulting in a training ignited prescribed fire. Natural ignitions, should they occur, will be grouped under training ignited fires.

b. Prescribed Fire Complexity. Determination of prescribed fire complexity shall be based on an assessment of technical difficulty and potential consequences. Complexity shall be used to delegate approval authority, set standards for personnel staffing and skill requirements, and to determine the level of burn plan detail. Prescribed fire projects should be classified as Complex, Intermediate, or Basic. Burn complexity will be determined by the Wildland Fire Program Manager and shall be made in the context of existing or potential social, political, economic, biological, and/or legal consequences.

1. Complex. Complex prescribed fires is defined as those where prescribed burning occurs under particularly challenging conditions and/or constraints. This classification includes prescribed fires where the difficulty of achieving resource management objectives is high, or where the consequences of project failure may be serious. All TIPFs shall be classified as complex fires.

2. Intermediate. This classification includes prescribed fires where the difficulty of achieving resource management objectives is not particularly high or complicated, and where the consequences of project failure are less serious and can be mitigated.

3. Basic. Prescribed fires of basic complexity are defined as those where few constraints, other than the normal prescription parameters, exist. This classification includes prescribed fires where achieving resource management objectives is routine and the probable consequences of project failure are low.

4.4.6. Prescribed Fire Requirements.

a. Management Ignited Prescribed Fires. A Prescribed Fire Burn Plan shall be completed for each management ignited prescribed fire. Prescribed Burn Plans describe expected results and the conditions necessary to achieve them as part of a vegetation management program. It shall include all items outlined below. The detail needed should be commensurate with project complexity. If a given item is not applicable (NA), it should be so indicated in the plan.

1. A description of the burn unit's physical location, including a map.

2. Identification of resource management objectives to be accomplished by the prescribed fire.

3. Desired effects and tolerable deviations.

4. Post burn evaluation responsibilities. Prescribed fire management of vegetation on Army training lands in Hawaii requires an understanding of the type, age class, condition, availability, and arrangement of the fuel that can impact the natural resources, structures, and soils. All prescribed burns must have measurable objectives. Monitoring must occur before and after each prescribed fire to document and verify that the stated objectives have been met.

5. Project area description that includes unit and fuel descriptors.

6. A fire prescription containing those key parameters needed to achieve desired results (i.e., acceptable fire behavior, acceptable limits of environmental elements) and provisions to record onsite conditions.

7. Sample outputs of desired ranges. The range of acceptable results expected, expressed in quantifiable terms.

8. Smoke management analysis. Prescribed burn plans shall include the following smoke management components: Actions to minimize prescribed fire emissions, evaluate smoke dispersion, public notification, air quality monitoring, and exposure reduction precautions. The Army fully supports the Clean Air Act (1967) and amendments to the Act (1972, 1977) to protect and enhance the quality of national air resources and to protect public health and welfare. The Army will comply with all applicable State of Hawaii and local laws pertaining to prescribed burning and the acquisition of appropriate burning permit(s).

9. Provisions for weather data collection, acceptable parameters, and forecasts.

10. Provisions for public safety and protection of sensitive features.

11. Provisions for inter/intra agency pre-burn coordination and, where applicable, public involvement and burn day notification to appropriate individuals, agencies, and the public.

Prescribed burn plans will be coordinated with directorates to include: Directorate of Public Works (DPW); Installation Fire and Safety Office (IFSO); Staff Judge Advocate (SJA); the Assistant Chief of Staff, G3, Directorate of Plans, Training, & Mobilization (ACofS, G3/DPTM); and Range Division - Hawaii. Technical experts from outside agencies (i.e., US Forest Service, National Park Service, and State of Hawaii, Division of Forestry & Wildlife) may review the Army's prescribed burn plans

12. Identification of the level of complexity of the fire and the appropriate organization needed. No less than the organization described in the approved plan shall be used to execute the burn. Minimum requirements for skill/knowledge element ratings of all elements of each position listed shall be stated. Describe the duties and responsibilities of positions within the organization.

13. A communication Plan.

14. Provisions for line construction, pretreatment, and holding actions to keep the fire within prescription. Firing techniques, containment, patrols, and mop up procedures are required.

a. Holding actions must be defined in the prescribed burn plan. The burn plan will allow the burn boss to take limited holding actions on fires outside the planned perimeter. However, there must be defined limits in the amount and kind of holding that can be done before any fire is determined to have exceeded the approved plan and must be declared a wildfire.

b. The limits of acceptable holding actions must be clearly stated in the prescribed burn plan. These limits must be defined as specific actions that can be taken, not general terms. If a prescribed burn accidentally crosses the prescribed perimeter, immediate action by the holding crews must be taken to control it.

15. Identification of contingency actions to be taken if the fire exceeds prescription parameters and/or line holding capabilities and cannot be returned to prescription with project resources. If the fire exceeds the predetermined and pre-approved constraints on holding actions, the fire must be declared a wildfire and appropriate fire suppression action taken. If a single spot fire escapes, it may be designated as a separate fire. If additional suppression forces are needed, the spot fire is declared a wildfire. The prescribed burn may continue as long as adequate holding forces remain on the prescribed burn as specified in the prescribed burn plan, separate from the suppression action on the spot fire, and the burn remains in prescription. In no case should the capability to hold the prescribed burn be jeopardized by moving essential holding forces to fight a spot fire.

16. A risk assessment that portrays an estimation of the probabilities and consequences of success/failure to the approving official. A safety plan and a "go-no-go" checklist is required.

17. Provisions for fire proximity to endangered species and plant boundaries; consideration of existing and predicted weather, fire behavior, and fuel conditions; and drought evaluation impact and/or effect.

18. The source of funding and estimated costs.

19. Provisions for a test fire and recording the results.

20. USARHAW/DPTM, RDH may establish additional requirements as needed to achieve prescribed fire objectives.

b. Training Ignited Prescribed Fire Burn Plan.

1. A site specific TIPF Burn Plan is required for each training ignited prescribed fire. This plan will be developed and approved prior to declaration of any fire as a TIPF. The only location that TIPFs will be allowed within USARHAW is within the impact area firebreak of SBMR and within the designated impact area of PTA. No other locations are suitable for use of this designation.

2. TIPFs will not be allowed during "RED" fire danger. Any previously designated TIPF that is still burning when the fire danger turns to "RED" will be declared a wildfire and suppressed accordingly.

3. Fires may only be designated as TIPFs by the Director, IFSO; the Wildland Fire Program Manager; or the PTA Deputy Fire Chief and/or Wildland Fire Coordinator (PTA only). Fires must be designated as a TIPF within 4 hours of ignition.

4. No more than one TIPF will be allowed within each impact area (SBMR or PTA) at any given time.

5. Once developed, the pre-existing plan will be approved by the Director, IFSO and by the Wildland Fire Program Manager. The programmatic elements of the TIPF Burn Plan shall include the following:

(a) General description of the area, history (including fire history), and map.

(b) Objectives to be achieved by the TIPF and identification of acceptable outcomes.

(c) Required skills, qualifications and organization necessary to implement and manage the training ignited prescribed fire program.

(d) Funding requirements.

(e) Inter/intra-agency coordination, including joint planning and review where fires may cross multi-agency boundaries.

(f) Program "Inform and Involve" actions both internally and externally. Include program planning as well as execution.

(g) Potential impacts of plan implementation including environmental, on/off site, socio-economic, and political impacts.

(h) Analysis and decision process that provides for:

(1) Identification of local approval authority.

(2) Identification of evaluation criteria for the initial "go/no go" decision.

(3) Risk assessment that considers, at a minimum, fire growth predictions; threat to life and property; smoke management concerns; local/regional/nation fire situation, including availability of resources; potential impacts on endangered species and plants; fire proximity to endangered species and plant boundaries; assessment of the amount of TIPF that is acceptable and manageable; consideration of existing and predicted weather, fire behavior, and fuel conditions; and drought evaluation impact and/or effect.

(4) Provision for daily revalidation.

(5) Timely decision by the Wildland Fire Program Manager.

(i) Identification of fuel treatment measures needed to reduce hazard fuels in support of the Army's prescribed fire program, including identification of areas or developments that need protection from fire.

(j) Process for development of a TIPF Plan.

(k) Process for monitoring and evaluating the TIPF.

(l) Escaped Fire Situation Analysis and contingency plan.

(m)Identification of maximum allowable perimeter.

(n) Monitoring actions to assure accurate and timely information on fire behavior, location, etc.

(o) Evaluation Plan for assessing outcome of the fire.

6. Some information will not be known until a TIPF fire actually starts. Individual TIPF Burn Plans shall also include the following:

(a) Holding actions necessary to keep the fire within prescription.

(b) Fire projections using both "expected" and "most severe" weather scenarios.

(c) An estimate of resource needs to manage the fire.

(d) Cost estimates to manage the fire.

4.4.7 Prescribed Fire Organization.

a. A Burning Boss, experienced with local weather, fire behavior, fuels, and terrain conditions shall personally supervise the burning operations on each management ignited prescribed fire. More complex burns may require a Lighting Boss and a Holding Boss. A Prescribed Fire Manager qualified to manage prescribed management ignited and TIPFs shall personally supervise operations.

1. Every management ignited prescribed fire requires the performance of the duties shown in this SOP. On smaller or less complex projects, one person may perform more than

one of the required duties. Larger or more complex projects will require more qualified people to perform necessary duties.

2. Every TIPF requires the performance of the duties outlined in Reference 4.4.1. The Prescribed Fire Manager will determine, through the development of the TIPF Burn Plan, the organization, expertise, and positions necessary to manage the prescribed natural fire.

3. The organization required varies with the size and complexity of each prescribed fire.

4. In the event of an escape, use personnel qualified under National Interagency Fire Qualification Handbook standards (NWCG Guide 310-1) to accomplish the required suppression activity. The temporary use of personnel who do not meet these qualifications is appropriate for prescribed fires that escape and are declared wildfires.

b. Prescribed Fire Planning Specialist. The Prescribed Fire Planning Specialist develops the Prescribed Fire Burn Plan for each management ignited or TIPF.

c. Prescribed Fire Manager. The Prescribed Fire Planning Specialist may determine by the complexity or number of prescribed fires that a Prescribed Fire Manager is necessary. On management ignited prescribed fires, the Burning Boss is responsible directly to the designated Prescribed Fire Manager for implementation and coordination of the assigned prescribed fire activities. The Prescribed Fire Manager shall:

1. Coordinate and schedule the ignition and management of two or more management ignited prescribed fires, or the management of a single TIPF.

2. Develop and implement the TIPF Burn Plan on appropriate training ignited fires.

3. Coordinate personnel and equipment requirements, including resources called for holding actions and contingency action section of the burn plan.

4. Ensure appropriate public notice is given prior to and during the prescribed fire activity.

5. Coordinate prescribed burn projects to avoid exceeding holding and contingency capabilities.

6. Monitor prescribed burn projects to ensure that all plan requirements are being met.

7. Record and report costs and accomplishments and recommend improvements to the Wildland Fire Program Manager.

d. Burn Boss. The Burn Boss has direct responsibility for on site implementation of specific actions in strict compliance with the approved Prescribed Burn Plan. The Burn Boss is accountable to the Prescribed Fire Manager. The Burn Boss has the following responsibilities that cannot be re-delegated:

1. Ensure safety of personnel.

2. Supervise all operations on the project site.

3. Ensure that all Prescribed Fire Burn Plan requirements are met and that personnel are briefed before proceeding with ignition.

4. To make the decision to proceed, accelerate, defer, or curtail operations based on attainment of the approved prescription criteria or lack thereof, including daily validation of prescribed criteria on multi-day projects.

5. Ensure that the fire prescription is met before proceeding with ignition.

6. Ensure that the forecast on site weather parameters are within prescription at the time of ignition and predicted to remain so during the expected life of the burn.

7. Ensure the availability of suppression resources in the event the prescribed fire escapes and is declared a wildfire.

8. Control directly, or through supervision of Lighting Bosses, the method, rate, and location of firing.

9. Maintain immediate and clear communications with the Lighting Boss and Holding Boss at all times.

10. Monitor fire behavior and terminate operations if fire behavior or effects are not according to prescription.

11. Accomplish mop up to predetermined standards in accordance with the Prescribe Fire Burn Plan.

12. Certify that the fire is out.

e. Lighting Boss. The Lighting Boss reports to the Burning Boss. The Lighting Boss will:

1. Maintain control of the ignition sources, including aerial ignition, on the burn project at all times.

2. Ensure deployment, sequence, and timing of all ignition sources to meet project objectives.

3. Supervise assigned personnel and ensure their safety.

4. Maintain immediate and clear communications with the Burning Boss and Holding Boss at all times.

5. If aerial ignition is used, ensure that the aerial ignition pilot is briefed on the Job Safety and Health Hazard Analysis, with emphasis on aerial flight hazards.

f. Holding Boss. The Holding Boss reports to the Burning Boss on management ignited prescribed fires. On prescribed natural fires the Holding Boss may report directly to the Prescribed Fire Manager. The Holding Boss shall:

1. Confine the prescribed fire within the planned area.

2. Take action when fire exceeds, or has the potential to exceed, the planned area.

3. Confer with the Lighting Boss, Burning Boss, Prescribed Fire Manager, as appropriate, to match holding and contingency capability with firing sequence.

4. Supervise assigned personnel and ensure their safety.

5. Maintain immediate and clear communications with the Burning Boss, Lighting Boss, or Prescribed Fire Manager, as appropriate, at all times.

REFERENCE 4.4.1
PRESCRIBED FIRE QUALIFICATIONS

Prescribed Fire Crewmember:

S-130 Basic Firefighter
S-190 Introduction to Fire Behavior
I-100 Introduction to ICS

Holding Specialist

I-220 Basic ICS
S-211 Portable Pumps and Water Use
S-270 Basic Air Operations
S-290 Intermediate Wildland Fire Behavior
S-200 Initial Attack Incident Commander Type IV
S-201 Fire Supervision
Qualified as a Prescribed Fire Crewmember

Ignition Specialist

S-215 Firing Methods
Qualified as a Holding Specialist

Prescribed Burn Boss II

RX-90 Burn Boss
Complete two certification burns under the supervision of a qualified Burn Boss
Qualified as an Ignition Specialist
Fire Behavior and Weather II
Two trainee assignments
Qualified as a fire crew member

Prescribed Fire Manager and Prescribed Fire Planning Specialist

Introduction to Fire Behavior Calculations S-390
Qualified as an Ignition Specialist 2 (RXF2) or as Incident Commander, Type 4 (ICT4)
RX-300 Burn Boss
RX-340 Introduction to Fire Effects
RX-450 Smoke Management Techniques

4.5. PREPLANNING WATER RESOURCES.

a. One of the most important resources for firefighters is an ample water supply. However, wildland fires often occur in areas where a water supply system is limited or not available. Firefighters must take advantage of auxiliary water resources near the fire or depend on water (and other agents) that are transported to the fire. Having access to water sources and the efficient use of that water can significantly affect the outcome of control efforts. Water storage resources are primarily used by fire trucks and for aerial fire bucket operations by rotary winged aircraft. If off military land, formal agreements between the Army and landowners that own these water resources are needed for those sources to be used.

c. In 1996, the Army constructed two dip ponds (each 300,000 gallon capacity) at Makua Military Reservation and six above ground dip tanks (each 80,000-gallon capacity) at Pohakuloa Training Area to enhance its water supply resources and fire fighting capability. (A list of available water resources and grid coordinates are included in Section 5.7, Aviation Plan). There are current plans for dip ponds at SBMR and KTA as well as 3 more dip tanks at PTA.

d. Sea and brackish waters are often the most readily available sources of water for wildland fire fighting in Hawaii. Military and local private contracted helicopters equipped with suspended buckets have been used routinely for some time in many areas to apply these impure waters on and around the fire. Most saline water research to date has been done on agriculture crop plants, which were evaluated for salt tolerance. However, no additional practical research is available in respect with native plants found in the Hawaiian ecosystems. What is known about the effects of using seawater on plants varies considerably. Those that are highly tolerant generally survive and predominate in areas subject to marine spray. Normally salt water spray can impact leaf and/or needle drop, but toxic effects will only be experienced when the salt solution penetrates the soil sufficiently to reach the root area. Thus, atmospheric conditions that favor rapid evaporation (high temperatures and winds) will generally result in the salt deposit being at or near the surface rather than in the root zone. Subsequent precipitation then impacts either penetration into the soils or runoff depending on the quantity of precipitation per unit time and the natural permeability of the soil in question. While the use of sea water is not recommended when fresh water is available, sea water will be used in emergency situations when fresh water is not available.

4.6. FIREFIGHTER TRAINING.

4.6.1 General.

a. USARHAW has adopted the standard training requirements as outlined in the 310-1, Wildland Fire Qualifications Guide, parts 1 & 2, (NWCG). All 25th ID(L) & USARHAW personnel engaged in suppression and prescribed fire responsibilities are required to meet the standards set in this plan.

b. The Federal Fire Department, Army Firefighters or outside cooperating agencies shall meet the required wildland training and physical fitness requirements outlined within each respective agency's established policies or training program.

c. Individuals will not be assigned to duties for which they lack training and/or certified experience. All personnel dispatched or assigned to wildfires or prescribed fires will be qualified for the fire position assigned, unless assigned as trainees under the direct supervision of higher qualified personnel at all times.

d. Applicability.

1. 25th ID(L) & USARHAW. This program establishes training and qualification requirements for wildland fire fighting personnel, planning, prevention, suppression, and supervision duties. The Wildland Firefighter Qualification Program is established to provide standardization for directorates and organizations that are responsible for wildfire duties under the Wildfire Management Program. Any USARHAW organization or directorate intending to supply human resources to wildfire incidents will be expected to meet the requirements described in this program.

2. Federal Fire Department (FFD), Naval Station, Pearl Harbor. Through an Interservice Support Agreement (ISA), the FFD has the responsibility for fire protection services on all Army lands on the island of Oahu. USARHAW recommends that the FFD adopt this program, or institute a similar policy to ensure that USARHAW receives the highest quality wildfire protection (See paragraph 4.6.3(b) below).

3. Fire Cooperating Agencies (DOFAW, County Fire, NPS). When responding to a wildfire incident on Army lands, the responding cooperative agency's wildfire qualifications are accepted at the firefighter level, and for internal agency supervision (within their own organization), while on the fire. (See paragraph 4.6.3(c) below)

e. Training Standards. USARHAW adopts the training standards established by the NWCG, Interagency Incident Management Systems for Wildland Fire Qualification under PMS 310-1, Wildland Fire Qualifications Subsystem Guide dated 2000. This program is designed to:

1. Establish minimum training, skills, knowledge, and experience for individuals involved in wildland fire fighting duties and to be qualified for wildland fire Incident Command System (ICS) positions.

2. Allow participating directorates and organizations within USARHAW to plan individual training requirements and assign responsibilities based on training, skills, and experience standards required to meet wildfire management needs within their areas.

4.6.2. Description of the Program.

a. Training Method.

1. The USARHAW Wildland Firefighter Qualification Program is an "educational" and "performance based" qualifications program. In this program the primary criteria for qualification is an individual's education in the courses described below, and hands on performance as observed by qualified individuals using approved standards.

2. The educational base of the program uses the completion of approved training courses with a passing score on an examination.

3. The performance-base of the program uses hands on evaluation under realistic conditions to ensure potential performance under live field conditions.

4. Qualification is based upon hands on course completion and real performance, as measured on the job, versus perceived performance, as measured solely by classroom activities.

5. Personnel who have learned skills from sources outside the Army, such as other agency specific training programs, may not be required to complete specific courses or training again in order to qualify in a wildfire position. However, this training and experience must be documented and be consistent with the requirements outlined in this program and approved by the Wildland Fire Program Manager.

b. Training Components. The components of the Wildland Firefighter Qualification Program are as follows:

1. Courses of Instruction. Courses of instruction have been developed by the NWCG for each position in the wildfire ICS. These courses have been designed to teach the basic information required to gain a general understanding of the position and provide technical knowledge required to perform duties required by the job. These courses are similar to college courses in that they start out at a basic level (100 level basic firefighter skills) and work up through higher levels of the ICS (up to 500 level national ICS skills). Courses are to be taught by trained and qualified instructors, experienced in the skill being taught. USARHAW will provide its own instructors for basic level courses (100/200 level), but will bring in outside qualified personnel from other state or federal agencies to teach at higher levels.

2. Position Task Books (PTB). PTBs are used to document performance demonstrations. PTBs are NWCG published booklets that apply to a specific position in the ICS. A PTB contains all critical tasks that are required to perform a given job. These booklets will be used by wildfire managers and supervisors to keep track of an individual's training experience. There will be a PTB for most positions included in the program. The tasks in each PTB have been established by the NWCG. PTBs have been designed in a format that allows documentation of a trainee's ability to perform each task. Tasks pertaining to tactical decision making and safety are flagged and require a position performance on a wildfire. Remaining tasks can be evaluated through other means such as simulation or other emergency and non-emergency work. Successful completion of all tasks required of the position will be the basis for recommending certification for a specific position in the ICS.

4.6.3. Certification.

a. Initial Certification.

1. Training certification requirements include completion of all required training courses prior to obtaining a PTB. Use of the training courses is required to prepare the employee to perform in the position. An employee will not be given a position assignment unless they have completed all necessary courses and training and applicable PTBs.

2. Training courses provide the specific skills and knowledge required to perform are listed in Reference 4.6.2.

3. Required training has been held to the minimum required for safe operations on a wildfire. All training will be available within USARHAW and is intended as the primary means by which personnel can prepare for qualification.

4. Certification of qualification for a position in the ICS will be documented and tracked by the IFSO, Wildland Fire Program Manager. Upon completion of each training course the Wildland Fire Program Manager, or training agency/organization will publish a memo to the Director of Fire and Installation Safety identifying personnel who successfully completed each course by name, organization, and ICS position that the individual is authorized to hold. A copy of the memo will be provided to the FFD, the individual who successfully completed the training, and the commander or director of organization that the individual belongs to. The Wildland Fire Program Manager is responsible for maintaining all memos and will compile a qualification list of all wildland trained personnel in USARHAW. Additionally, the Wildland Fire Program Manager may document training by issuing an incident qualification card. This is for use in identifying to outside agencies that the individual is qualified to perform in a specified position.

5. The quality of experiences gained in a given position will be closely evaluated when making a determination for advancement to the next higher position or to a different position. The quality of experience may relate to the number of assignments in which an individual performed, the size of the incident, and the complexity of operations overseen.

6. This program will not determine the number of times an individual should serve as a trainee or how many times a given position should be filled before advancement. Determination will be made by the supervisor based on task evaluations, position performance evaluations, and their own judgment on the quality of an individual's experience. Supervisors will submit recommendations for advancement or change in positions to the Wildland Fire Program Manager.

7. Personnel will not be assigned any wildland fire duties without proper certification. Personnel that have the basic Firefighter 2 (FFT2) can be assigned a training status to higher level positions provided that they are directly supervised by an individual qualified/certified for that position and have completed the necessary coursework.

b. Currency Requirements

1. Unless otherwise noted, the maximum time allowed for maintaining currency is five (5) years for all positions. For example, the currency requirement for a Task Force Leader is to have functioned in a satisfactory manner in the last five years as a Task Force Leader or above.

2. Currency requirements for positions may be met by performing the particular position or any higher position, and any specified lower or similar duties. This type of position experience will be considered as qualifying only if the individual has previously met all training and prerequisite experience requirements for the position. Serving in a position for which the individual is qualified will maintain the currency of a prerequisite position, providing that the individual was previously qualified in that position.

3. Refresher training is also a way to maintain currency. Refresher training will be arranged at various intervals to keep personnel updated on the requirements for specific positions but also new developments within the given field.

4. Recertification. This responsibility includes evaluation of personnel for recertification in cases where position qualifications have been lost as a result of a lack of current experience. A key component in the certification or recertification process is the subjective evaluation by management of an individual's capability to perform in a position. Managers can request recertification of prior qualified personnel by submitting a memo to the Wildland Fire Program Manager stating the reasons for recertification and any mitigating issues that can show the individual has either maintained or relearned skills necessary to accomplish the job. The Wildland Fire Program Manager may design a specific individual refresher course prior to recertification.

c. Training.

1. The Wildland Fire Program Manager will develop an overall program.

2. The Wildland Fire Program Manager will develop an annual schedule of course instruction and a training plan for each Fiscal Year (FY) for all of USARHAW.

3. Training will be coordinated among USARHAW fire managers, land managers, and the FFD. Training will be announced with sufficient time for supervisors to schedule and meet workloads.

4. Training may be arranged by any USARHAW agency. However, training must meet the criteria of this program and meet NWCG standards. Training by any USARHAW agency will be open to include personnel from the command or outside cooperative fire agencies.

5. The training plan should be coordinated with other outside fire managers and other outside cooperative agencies for cross-leveling and sharing of training opportunities within the State of Hawaii.

4.6.4. Fitness Standards. Personnel assigned to wildfire duties are required to meet the following standards for physical fitness. The fitness level that personnel shall meet depends on what ICS position they are assigned (See Section 4.6.6).

a. Fitness Categories.

1. Arduous. Duties involve fieldwork requiring physical performance, over an extended period of time, calling for above-average endurance and superior conditioning. These duties may include a demand for extraordinarily strenuous activities in emergencies under adverse environmental conditions and over extended periods of time. Requirements include running, walking, climbing, jumping, twisting, bending, and lifting more than 50 pounds; the pace of work typically is set by the emergency situation.

2. Moderate. Duties involve field work requiring complete control of all physical faculties and may include considerable walking over irregular ground, standing for long periods of time, lifting 25 to 50 pounds, climbing, bending, stooping, squatting, twisting, and reaching. Occasional demands may be required for moderately strenuous activities in emergencies over long periods of time. Individuals usually set their own work pace.

3. Light. Duties mainly involve office type work with occasional field activity characterized by light physical exertion. Activities may include climbing stairs, standing, operating a vehicle,

and long hours of work, as well as some bending, stooping, or light lifting. Individuals almost always can govern the extent and pace of their physical activity.

4. None. Duties are normally performed in a controlled environment, such as an incident base or camp.

b. Fitness Testing. There are four accepted methods of testing physical fitness:

1. A 1-1/2 mile run/walk. The individual, of any age or sex, must run/walk a distance of 1-1/2 miles on level terrain within 11 minutes and 40 seconds.

2. The Pack Test. Similar to the run/walk, the individual carries a backpack a prescribed level distance within a prescribed time:

Arduous. Individual must carry a 45-lb backpack 3 miles in 45 minutes or less.

Moderate. Individual must carry a 25-lb backpack 2 miles in 30 minutes or less.

Light. Individual must hike 1 mile in 15 minutes with no pack.

The Army Physical Readiness Test (APRT) per FM 21-20.

3. The Volume Oxygen. VO2 test determines physical fitness as the measurement of an individual's ability to take in, transport, and use oxygen, which is the most important factor affecting ability to perform sustained arduous work. The best measure for determining health and functional ability is maximal oxygen consumption (Max V02). Max V02 is a measure of the maximum rate that oxygen can be consumed and is expressed in milliliters of oxygen per kilogram of body weight per minute. This ranges from about 20 milliliters for poorly conditioned people to about 80 for endurance athletes such as distance runners and cross-country skiers. Only medical staff may administer the VO2 test. This test requires a clinic with the equipment and trained staff to administer the test. The following Max V02 levels have been set for the four categories of physical fitness:

Arduous, requires a Max V02 of 45.

Moderate, requires a Max V02 of 40.

Light, requires a Max V02 of 35.

None, no testing is required.

4.6.5. Responsibilities.

a. IFSO Wildland Fire Program Manager

1. The IFSO, Wildland Fire Program Manager is responsible for selecting required courses, potential trainees, proper use of task books, certification of trainees, documentation of course completion, and qualification and selection of the personnel to fill ICS positions.

2. The Wildland Fire Program Manager is responsible for certifying and recertifying qualifications of personnel based on the requirements of this program.

3. The Wildland Fire Program Manager will develop an annual schedule of course instruction and a training plan for each Fiscal Year. The Wildland Fire Program Manager will submit the training plan and course of instruction to the Director of Installation Fire & Safety for review and approval.

4. The training plan should be coordinated with other fire managers and outside agencies for cross-leveling and sharing of training presentation.

b. Director of Installation Fire & Safety.

1. Approve the annual training plan and courses of instruction.

2. Monitor training for standardization.

3. Coordinate training with the FFD.

c. Commanders, Directors, Supervisors and Leaders.

1. Ensure individuals assigned to ICS positions are qualified.

2. Ensure individuals are available for scheduled training.

3. Notify the Wildland Fire Program Manager when qualification of personnel expires.

d. Incident Commander (IC).

1. The supervisor or IC on an incident is responsible for managing a training and qualification program on the incident, should one be used.

2. Consider the qualifications of outside fire departments or cooperating responders for duties at the incident.

3. Ensure qualified/certified personnel are assigned fire duties.

4. Ensure that if personnel are assigned duties for which they are not properly certified, that they are directly supervised by someone who is qualified.

e. Individuals Firefighters.

1. The individual is responsible for showing proof of qualifications and completing training.

2. The individual is responsible for informing their supervisor when qualification requirements have expired.

4.6.6. Complexity of Incidents for Qualification.

a. Incident Types. A specific fire incident can be resolved through simple or complex responses. Normally larger fires affecting multiple landowner and requiring multiple agency response are more complex than single resource or agency responses. These increases in complexity are referred to as "Types" of incidents.

1. There are many factors that determine the complexity of an incident, such as size, location, threat to life and property, political sensitivity, organizational complexity, jurisdictional boundaries, values-at-risk, fuel type, topography, policy, etc.

2. The ability and qualifications of the ICS personnel assigned to manage a specific type of incident are the responsibility and at the discretion of the Senior Fire Officer (SFO) in charge at the scene of the fire incident. The IC, or designated representative must determine the complexity of an incident and assign qualified personnel as needed.

3. The following descriptions are only guidelines to assist the SFO in determining the complexity of an incident. The IC must obtain the qualifications necessary to handle the incident separately from the typing of the fire incident. NOTE: The incident types are in no way related to the federal firefighter certification qualifications (e.g., FFT1/2).

b. Type 4 Incident. (Initial Attack Response)

1. Within USARHAW about 95 percent of all wildland fire incidents fall into this type. These are small incidents of relatively simple complexity that are handled with very few fire fighting forces. This type of incident has the following characteristics:

2. Resources vary from a single firefighter to several single resources. Possibly a single Task Force or Strike Team.

3. Normally limited to one operational period (workday) – at least the control phase. Mop up may extend into multiple periods.

4. Normally does not require a written action plan.

5. Normally the ICS upper level (fire fighting) positions will not be activated.

c. Type 3 Incident. (Extended Attack Response)

1. Initial responses with a large number of resources or an extended attack are examples of this incident type. In large Type 3 situations, the incidents may be relatively small (less than 40 hectares), but in rangeland vegetation the fire size could be significantly larger (400 hectares or more). Characteristics of a Type 3 Incident are:

2. Resources vary from several single resources to several Task Forces/Strike Teams.

3. The incident may be divided into divisions, but usually not meet the Division/Group complexity in regards to span-of-control. The incident could be divided into segments.

4. May involve multiple operational periods prior to control. If so, a written action plan would be required.

5. Some fire fighting Command and General Staff positions may be activated, but usually not at the Division/Group Supervisor and Task Force Leader level.

6. May utilize staging areas and establish a base.

d. Type 2 Incident. (Extended Attack, Multiple Agency Response)

1. This is the first level at which most or all of the Command and General Staff positions are activated. The IC and the Command/General Staff must function as a team. Handling all aspects of supervising a large organization, multiple operational periods, gathering information to develop an action plan, the development of an action plan, and providing logistical support to include the establishment and operation of a base and possibly camps. Characteristics of a Type 2 Incident are:

2. Most or all of the Command/General Staff positions are filled.

3. Base/camp(s) are established.

4. The incident extends into multiple operational periods.

5. A written action plan is needed and prepared.

6. Many of the functional units are needed and staffed.

7. Number of line workers per operational period usually does not exceed 200 and the total personnel on the incident normally does not exceed 500.

e. Type 1 Incident. (Large Scale Extended Attack Response)

1. The primary difference between a Type 1 and a Type 2 Incident is a matter of size and complexity. USARHAW does not have a requirement to form a Type 1 ICS. A fire this size will have extended beyond the installation boundaries and involve multiple agencies and landowners. If the Army has a requirement to maintain responsibility for the fire, USARHAW may need to request a Type 1 Command team from another federal agency. However, USARHAW may be required to assist in staffing a Type 1 ICS with personnel that may be trained in Type 1 duties. The factors that affect the decision to go to a “Type 1” operation are extremely variable and depend to a large extent upon the needs of the local fire fighting force. A Type 1 Incident almost always requires the establishment of divisions that require Division/Group supervisor qualified personnel and may require the establishment of branches. Incident management teams assigned to Type 1 Incidents are the fire departments most qualified personnel. The Type 1 Incident meets all of the criteria of a Type 2 Incident plus the following:

2. Usually all Command and General Staff positions are activated.

3. Operations personnel may often exceed 500 personnel per operational period and total personnel on the incident will exceed 1000.

4. This is a large, complex incident and requires well-qualified personnel at the IC and Command/General Staff level. In most cases the personnel qualified at this level will have had multiple Type 2 assignments before being qualified and assigned at this level.

4.6.6. Position Categories. Positions found in the ICS organizational system can be divided into three catagories: Non-Operational Technical Specialists, Skilled Operational positions and Aviation Pilots, as listed on the following pages.

a. Non-Operational Technical Specialist. Technical Specialists are personnel with special knowledge or skills who are activated for type 3 or higher wildfire incidents and only when needed. These Technical Specialists are normally not required on the fireline and are used at base camps or support facilities. Due to the nature of the military, the Army's organizational structure is similar to the ICS and its designed functions. These are jobs that are typically found in the normal daily operations of the USARHAW. Personnel that can man these Technical Specialist positions normally have a daily job were their Civil Service classification or Military Occupation Skills (MOS) match the position named in the ICS. No minimum ICS qualifications are prescribed in this program because these personnel normally perform the same duties during an incident that they perform in their everyday job and are not near the fireline. Most Technical Specialists are certified in their field or profession. The support they provide an IC is exactly that which they apply daily. The ICS positions below are listed with the acceptable civil service or military position listed on the same line. These are the only positions that may be substituted for formal ICS training:

ICS POSITIONS (Non-Operational)	
Agency Representative:	Commander, Director or Public Affairs Officer (PAO)
Information Officer:	PAO
Base/Camp Manager:	Commanders or Operations/Maintenance/Range Officers
Logistics Section Chief:	Supply or Director of Logistics (DOL) Representative
Claims Specialist:	Staff Judge Advocate (SJA) Representative
Commissary Manager:	Unit Food Service Officer/NCO or DOL
Medical Unit Leader:	Division Surgeon, Senior Medical Officer
Communications Unit Leader:	Signal Officer or Operations Officer
Compensation/Claims Unit Leader:	SJA
Compensation-for-Injury Manager:	Civilian Personnel Assistance Office (CPAC) and SJA
Cost Unit Leader:	Director of Resource Management (DRM)
Demobilization Unit Leader:	Commander or Operation/Range Officer
Display Processor:	PAO or Operations/Range Officer
Ordering Manager:	Unit /Organizational Supply or DOL
Documentation Unit Leader:	Management Assistant or Secretary
Equipment Manager:	Unit Organizational/Supply, Maintenance and DOL
Equipment Time Recorder:	Owning unit or organization DOL/DPW
Facilities Unit Leader:	Operations/Range Officer or Director of Public Works (DPW)
Finance/Admin Section Chief:	Agency/Organizational Management Assistant or DRM
Food Unit Leader:	Unit Food Service Officer/NCO or DOL
Security manager:	Military Police
Service Branch Director:	Commander, Director, Operations/Range Officer
Personnel time Recorder:	Organizational Management Assistance/Time Keepers
Procurement Unit Leader:	Unit/Organizational Supply or DOL
Receiving/Distribution Manager:	Unit/Organizational Supply or DOL
Staging Area Manager:	Operations/Range Officer
Status/Check-In Recorder:	Management Assistant or Time Keeper
Supply Unit Leader:	Unit/Organizational Supply
Support Branch Director:	Operation/Maintenance/Range Officer or DOL/DPW
Infrared Interpreter (IRIN):	G2, ITAM LCTA Coordinator

There are no fitness requirements for non operation technical specialist positions if they are not located on the fire lines. For all technical specialist personnel whose skills are needed on the fireline, the physical fitness level shall be light.

b. Skilled Operational Positions. These positions are fireline or fire area jobs unique to wildland fire suppression. They require a level of specific skills and knowledge to perform wildfire suppression jobs and are those positions not normally found in other civil service positions in the Army. Personnel should be assigned only positions in which they have demonstrated the ability to perform successfully. The following positions require skill qualification training per Reference 4.6.3 to qualify for Wildland fire fighting and ICS positions:

ICS POSITIONS (Skilled Operational)
Advanced Firefighter/Squad Boss (FFT1)
Crew Representative (CREP)
Crew Boss (Single Resource) (CRWB)
Dozer Boss (Single Resource) (DOZB)
Engine Boss (Single Resource) (ENGB)
Felling Boss (single Resource) (FELB)
Firing Boss (Single Resource) (FIRB)
Fire Behavior Analyst (FBAN)
Firefighter (FFT2)
Helibase Manager (HEB)
Helicopter Coordinator (HLCO)
Helicopter Crew Member (HECM)
Helicopter Manager (HEMG)
Incident Commander Type 1 (ICT1)
Incident Commander Type 2 (ICT2)
Incident Commander Type 3 (ICT3)
Incident Commander Type 4 (ICT4)
Incident Communications Manager (INCM)
Planning Section Chief Type 1 (PSC1)
Planning Section Chief Type 2 (PSC2)
Resource Unit Leader (RESL)
Safety Officer (SOF1)
Safety Officer (SOF2)
Situation Unit Leader (SITL)
Strike Team Leader Dozer (STDZ)
Strike Team Leader Crew (STCR)
Strike Team Leader Engine (STEN)
Strike Team Leader Tractor/Plow (STPL)
Task Force Leader (TFLD)
Tractor/Plow Boss (Single Resource) (TRPB)
Training Specialist (TNSP)

These positions require the specific training listed in this program. Personnel with basic qualifications may be assigned to upper level positions without the qualification, provided that they are directly supervised by a supervisor qualified in that position.

c. Aviation Pilots.

(1) Qualification/Currency: Commanders must consider training limitations, (lack of fire bucket mission availability), prior to inclusion of additional Task #3016 (below) on an individuals Commander's Task List.

(2) Crew members are required to have demonstrated proficiency to an Instructor Pilot (IP), Standardization Pilot (SP), Non-rated Crew Member Instructor (FI), Non-rated Crew Member Standardization Instructor (SI) in Task #2016, External Load Operations, prior to participation in fire bucket operations. For initial qualification, crew members must be familiar with this SOP and demonstrate proficiency to an IP/SP, FI/SI as appropriate in Additional Task #3016, Perform Fire bucket Operations.

(3) Currency: Crew members will be considered current for fire bucket operations as long as they comply with annual task/iteration requirements specified on the Commander's Task List.

(4) Training requirements. (See Section 5.7)

REFERENCE 4.6.2
TRAINING COURSES, INCIDENT COMMAND SYSTEM (Wildland Firefighter Skills)

TRAINING COURSES

ICS Courses

I-100 Introduction to ICS
I-200 Basic ICS
I-300 Intermediate ICS
I-400 Advanced ICS
I-401 ICS for Executives

Skill Courses

S-000 Agency Specific Training
S-110 Wildland Fire Suppression Orientation Principle for Non-Operations Personnel (optional)
*S-I30 Firefighter Training
*S-I90 Introduction to Fire Behavior
S-200 Initial Attack Incident Commander
S-201 Fire Supervision - 2nd Edition
S-203 Introduction to Information Officer
*S-205 Fire Operations in the Urban Interface
S-211 Portable Pumps and Water Use
S-212 Power Saws
S-216 Driving for Fire Service
*S-2I7 Interagency Helicopter Training Guide
S-230 Crew Boss (Single Resource)
S-231 Engine Boss (Single Resource)
S-232 Dozer Boss (Single resource)
S-233 Tractor/Plow Boss (Single Resource)
S-234 Firing Methods and Procedures
S-235 Felling Boss (Single Resource)
S-244 Field Observer
S-258 Communications Equipment/Procedures
*S-590 Fire Behavior Analyst
S-260 Fire Business Management
S-270 Basic Air Operations
*S-27I Helibase Manager
*S-290 Intermediate Fire Behavior
S-300 Incident Commander Extended Attack
S-301 Dynamic Unit Leadership
S-320 Unit Leader
S-330 Task Force/Strike Team LDR
*S-336 Fire Suppression Tactics
S-339 Division/Group Supervisor
*S-378 Air Attack Group Supervisor
S-390 Fire Behavior Calculations
S-401 Effective Management
S-402 Liaison Officer
S-403 Information Officer
S-404 Safety Officer
S-420 Command and General Staff
S-443 Infrared Interpreter
S-445 Training Specialist
*S-470 Air Operations Branch Director
*S-490 Advanced Fire Behavior Calculations
S-520 Advanced Incident Management
S-620 Area Command

*Indicates a course that contains critical knowledge and skills required for safe operations on a wildfire. Training in this course or an agency equivalent course with like learning and performance objectives is mandatory. Statistics indicate that lack of this type of knowledge and/or skill may have contributed to accidents.

REFERENCE 4.6.3
WILDLAND FIREFIGHTER TRAINING QUALIFICATION REQUIREMENTS FOR ASSIGNED PERSONNEL

WILDLAND FIREFIGHTER QUALIFICATION COURSES
FIREFIGHTER & AUXILIARY PERSONNEL

FIREFIGHTERS/AUXILIARY OPERATIONS TRAINING

COURSE	TITLE	HOURS
FIREFIGHTER 2 (FFT2)		
S-130	Firefighter Training	32
S-190	Introduction to Fire Behavior	8
I-220	Basic Incident Command Sys	16
FIREFIGHTER 1 (FFT1)		
S-210/200	Fire Supervision	40
S-211	Portable Pump & Water Use	16
S-212	Wildfire Powersaws	32
CREW BOSS (CRWB) Single Resource		
S-230	Crew Boss	32
S-234	Firing Methods & Procedures	24
S-260	Fire Business Mgt Principles	8
S-270	Basic Air Operations	16
S-290	Intermediate Wildland Fire Behavior	32
STRIKE TEAM LEADER (STLD)		
S-200	Initial Attack Incident CMD	32
TASK FORCE LEADER (TFLD)		
S-336	Fire Suppression Tactics	32
S-390	Intro to Wildland Fire Behavior	40
I-333	Strike Team Ldr	16
I-330	Task Force, Strike Team Ldr	40
S-205	Fire Operations in the Urban Interface	32
HELICOPTER AIR OPS		
S-270	Basic Air Operations	16

FIREFIGHTER COMMAND/STAFF TRAINING

COURSE	TITLE	HOURS
DIV/GROUP SUPERVISOR (DIVS)		
I-339	Div/Group Supervision	12
I-375	Air Support Group Supervisor	32
OPERATION SEC CHIEF 2 (OSC2)		
S-401	Effective Management	
I-420	Command & General Staff	40
I-400	Incident Command	24
I-430	Operations Section Chief	40
OPERATION SEC CHIEF 1 (OSC1)		
S-520	Advanced Incident Mgt	40
INCIDENT COMMANDER 4 (ICT4)		
CRWB	QUALIFIED	
INCIDENT COMMANDER 3 (ICT3)		
TLFD	QUALIFIED	
S-300	Incident Cmd Multiple Resources	8
INCIDENT COMMANDER 2 (ICT2)		
DIVS	QUALIFIED	
I-400	Incident Commander	24
AREA COMMANDER (ACDR)		
	All operations training	
	All Command/Staff training	
S-620	Area Command	40

REFERENCE 4.6.4
WILDLAND FIREFIGHTER TRAINING QUALIFICATIONS REQUIREMENT FLOW CHARTS

KEY TO WILDLAND FIREFIGHTER QUALIFICATION FLOW CHART

The chart in this reference shows the progression of qualifications from one position to another within the USARHAW Fire Management system. Because there is not a formal USARHAW wildland fire fighting force, these charts are not organization charts but are used to illustrate the training and physical fitness requirements for personnel that are assigned to each job classification. Each box within the chart contains information pertaining to prerequisite qualifications, training and physical fitness and should be read as shown in the diagram below:

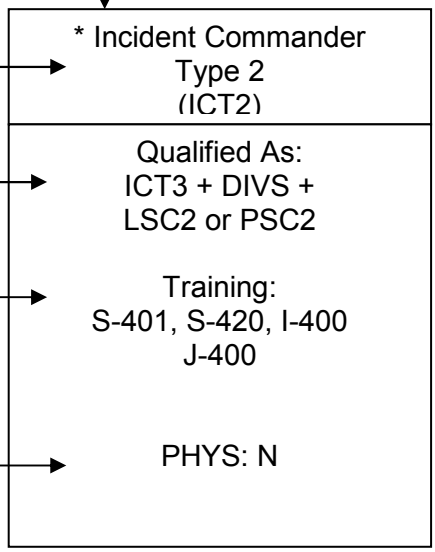
An asterisk (*) indicates that a "position performance assignment" on a wildland fire is required prior to final qualification in this position

Job title & mnemonics identifier for position.

Lists positions (by mnemonics) for which a prerequisite qualification is required.

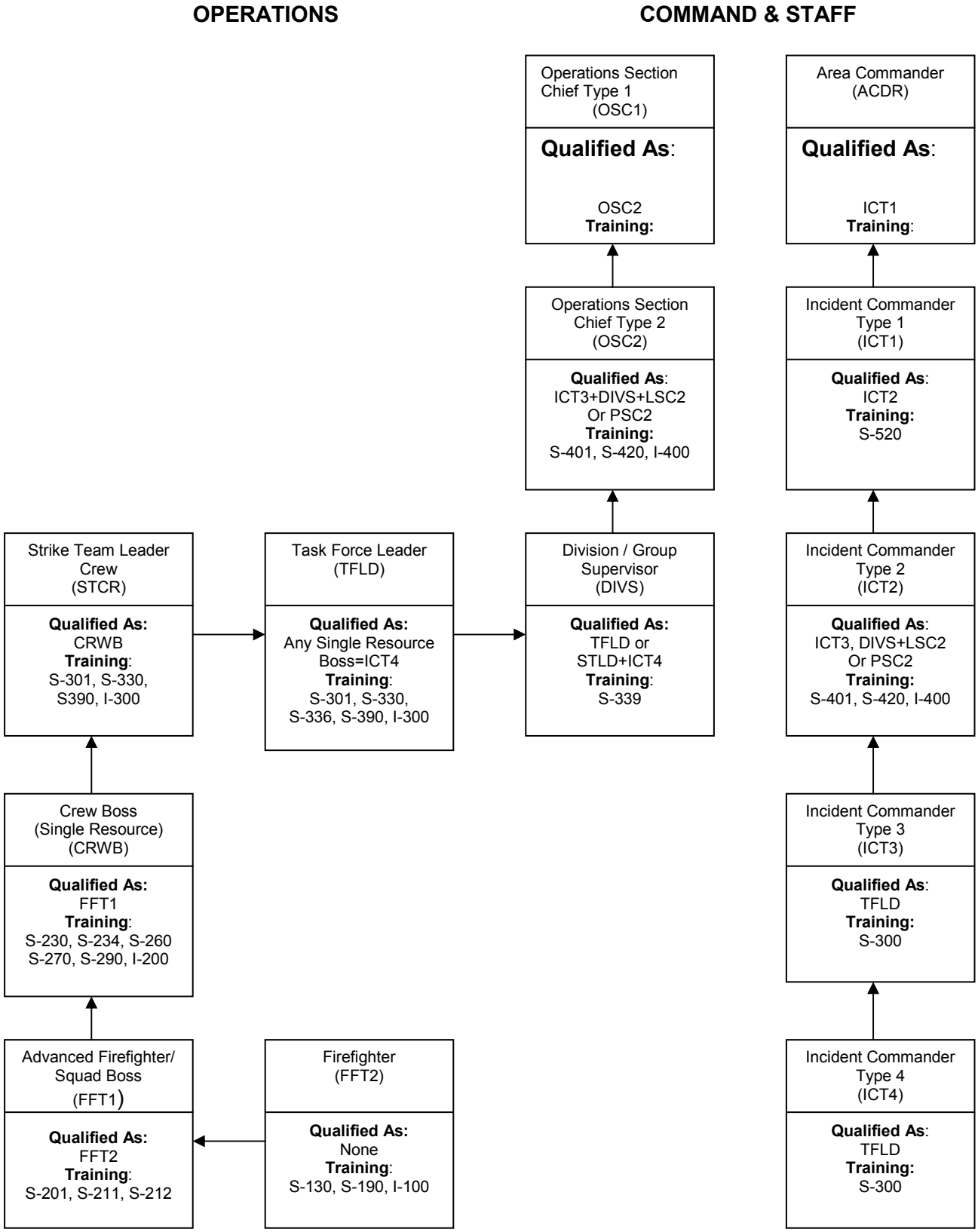
List training courses (S & I courses & job J aids) which will support performance & qualification in this position

Identifies required level of physical fitness for this position.



A – Arduous
M – Moderate
L – Light
N – None

REFERENCE 4.6.4 (CONT.)
WILDLAND FIREFIGHTER TRAINING QUALIFICATION REQUIREMENTS FLOW CHARTS



5.1. RESPONSIBILITIES.

5.1.1. USARHAW, Installation Fire and Safety Office.

a. The Wildland Fire Program Manager is in the IFSO. The WFPM shall ensure that manpower, supplies, equipment, and other cooperative fire fighting resources are available to meet the required goals and objectives of the IWFMP. Each FMA shall be required to maintain the minimum level of fire fighting resources as identified in this section.

b. The Director of Installation Fire and Safety is the proponent for the Army's fire protection program. The Director acts as the Command Fire Marshal who sets policy and has safety oversight. The IFSO has authority over the PTA Fire Department, the IFSO Strike Team, and provides direct Army oversight over the FFD on Army installations in accordance with the interservice agreement.

5.1.2. USARHAW, G3/DPTM, Range Division Hawaii (Range Control). Certain Range Control personnel trained in wildland fire fighting shall be utilized for initial attack response to fires reported on PTA and Oahu training ranges until the IFSO Strike Team is operational. Upon arrival at the site, Range Control fire fighting personnel will assess the fire conditions and determine fire control equipment and personnel requirements necessary to execute initial attack operations. In the event fire escapes the initial attack, a contingency plan will be implemented in accordance with established procedures outlined in the wildfire SOP for each respective FMA.

5.1.3. PTA Fire Department. Under direction of the PTA Deputy Fire Chief, the fire department is responsible for providing wildfire protection services at PTA. The PTA Deputy Fire Chief shall be familiar with the provisions outlined in this plan and provide qualified personnel to support the wildland fire management program.

5.1.4. Federal Fire Department. Through an interservice agreement, fire protection/prevention, aircraft rescue fire fighting, and wildland fire suppression services are provided by the Federal Fire Department, Navy Region Hawaii, at all installations under the jurisdiction of the USARHAW.

5.2. FIRE SUPPRESSION ACTIONS.

5.2.1. Fire Suppression. The objective of fire suppression is to attack and suppress wildfires at minimum cost while protecting values at risk and minimizing the impacts from suppression activities. For purposes of this fire management plan, a wildfire is defined as a free burning and unwanted fire requiring suppression action. Wildfire suppression is an emergency operation and takes precedence over all other operations, including training, with the exception of safeguarding human life. In some cases, a wildfire on Army training lands can be controlled with a single attack response vehicle; in others, large numbers of firefighters, fire apparatus, and equipment may be required. Because of this range of resource needs, fire suppression can be relatively simple and straightforward or extremely complex.

5.2.2. Standing Operating Procedures. USARHAW has developed pre-incident wildland fire Standing Operating Procedures (SOP) that provide guidelines intended to assist firefighters and the Incident Commander (IC) in establishing priorities and making fire suppression decisions

(see Appendix 1). These plans describe the most likely organizational structures for controlling a range of possible fire scenarios at a given FMA. Each SOP is designed to identify needed resources, most likely access routes, as well as the location of plant communities, sensitive habitat areas, archeological sites, and available water resources. The SOP outlines the most likely deployment of personnel and equipment at each FMA. Each SOP identifies minimum staffing levels. For personnel safety, no action is to be taken on an incident if the staffing level available is below the identified minimum. All available resources assigned to the area will move to the reported incident and commence suppression action when doing so has been deemed safe. All wildfires will require immediate suppression response adopting a confine, contain, or control strategy using the Incident Command System (ICS). Every strategy chosen shall be documented and monitored by the IC. SOPs address initial attack, extended attack, and major fire attack and also include, but are not limited to the following:

a. Detection and reporting procedures.

b. Descriptions of organizational functions and delineation of responsibilities.

c. Type of equipment and number of personnel needed.

d. Description of support services needed.

e. Notification and operating procedures

f. Radio frequency assignment.

g. Maps showing topography, possible staging areas, target hazards, access routes.

h. Rosters of interagency resources and ordering procedures.

i. Special concerns/needs (i.e., biological sensitive areas, impact areas, UXO's).

5.2.3. Fire Management Strategies.

a. Fire management policy for all military training lands will be to implement a suppression strategy for all unplanned ignitions. The Army recognizes three levels of suppression response: confine, contain, and control. The difference among these strategies is subtle in many cases, but the consequences can be substantial. The definitions are as follows:

(1) **Confine**. Confine is to restrict the wildfire within boundaries established either prior to, or during the fire. These identified boundaries will confine the fire, with "no action being taken" (line construction, bucket drops, etc.) to suppress the fire.

(2) **Contain**. Contain is to restrict a wildfire to a defined area, using a combination of natural and constructed barriers that will stop the spread of the fire under the prevailing and forecasted weather conditions until out. This means, "some action has been taken" (line construction, bucket drops, etc.) to suppress the fire.

(3) **Control**. Control is to aggressively fight a wildfire through the skillful use of personnel, equipment, and aircraft to establish fire lines around a fire to halt the spread and to extinguish all hot spots, until out.

b. All three strategies require continuous observation of fire behavior. When possible, fires will be managed in a control mode to minimize fire size. Considerations of contain and confine strategies will be incorporated to provide for human safety and/or other aspects. Suppression strategy considerations:

(1) Always provide first for firefighter and public safety.

(2) Use natural and man-made barriers to help in the rapid control of incidents to reduce exposure of fire fighting personnel to hazard areas and Unexploded Ordnance (UXO).

(3) Base appropriate method of attack on fire behavior and available suppression resources.

(4) Assess environmental impacts resulting from suppression activities to be they are outweighed by the values at risk.

(5) Assign priority protection to all known threatened and endangered species and cultural sites.

(6) Provide for the protection of capital investments on and immediately surrounding the training area.

c. The SOP considers military training activities that are potential sources of unplanned ignitions, and the types of resources that need to be on site to take rapid action on ignitions.

5.2.4. Fire Management Option/Alternatives.

a. Fire suppression alternatives range from immediate and aggressive suppression to no attack. As presented, the alternatives set standards for selection of the appropriate option by the IC. Further, they provide basic guidance and parameters within which the IC makes initial strategies and tactical decisions.

b. In the event of potential fire escape from Army land, the IC must consult with the owner or manager of the adjacent lands to select a fire management option based on an evaluation of local conditions. The most appropriate level of suppression will be chosen by the IC depending upon the anticipated consequences and management objectives for the area likely to burn. This is also part of the Escaped Fire Situation Analysis.

c. Options are not “set in stone” when applied to specific areas. Rather, the application of the options must be flexible and subject to revision as conditions change, such as formulation of specific land use objectives, environmental considerations, and availability of new data.

d. During the critical portion of the fire season, most fires will receive an aggressive initial attack. If the fire escapes initial attack and requires more than a modest commitment to contain it, an extended attack and an escaped fire situation analysis will be conducted to determine the level of suppression justified by the values at risk. Minimizing acres burned must be balanced with suppression costs.

5.2.5. Description of Management Options.

a. Critical Suppression Management Option (Control): This option was specifically created to differentiate the protection of human life and inhabited property from natural resource protection. Unquestioned priority over all other fires is automatically given to sites (areas) identified in this option.

(1) Policy. This designation is for those areas where fire presents a real and immediate threat to human safety and designated physical urban developments. Fires burning in these areas will be immediately and aggressively suppressed.

(2) Objectives. Protect human life and inhabited property. Place highest priority on the allocation of suppression forces to sites (areas) that qualify for this option. Limit damage from fire to the minimum achievable.

(3) Operational Considerations. Areas designated by this option are restricted to sites and immediate surrounding areas. Managers are encouraged to exercise restraint in the designation of physical urban developments, limiting the application of this option to those sites which are currently or routinely occupied as a residence, or of such high economic or cultural value that fire could cause irretrievable loss. Coordinate immediate request for mutual aid assistance to augment fire suppression efforts as necessary.

b. Full Suppression Management Option (Control): Areas assigned this designation will receive the best fire protection available. That is, all fires in these areas will receive aggressive initial attack and aggressive suppression efforts until the fire is declared out. This option was designed for the protection of natural/cultural sites, high resource value areas, and resources that require wildland fire protection but do not involve the protection of human life and habitation.

(1) Policy. Fires burning under this designation will be controlled through immediate and aggressive action.

(2) Objectives. Regardless of fire weather or behavior, control all fires at the smallest acreage possible. Minimize disruption by fire of designated, planned, or ongoing human activities in the area. Environmental impacts resulting from suppression activities will be commensurate with the values at risk.

(3) Operational Considerations. Only fires in the critical protection area receive a higher priority for suppression resources. Incorporate priority protection to all known threatened and endangered species and cultural sites.

c. Limited Suppression Management Option (Confine): This category recognizes locations where a let it burn policy is desirable or the values at risk do not warrant the high expenditure of suppression funds. Suppression actions are outlined to the extent necessary to keep a fire within the designated area or to protect critical sites within the area. This policy will only apply to the SBMR impact area.

(1) Policy. Confine fires and prevent undesirable escape from this area.

(2) Objectives. Reduce overall fire suppression costs. Allow fire to burn unimpeded to the fullest extent possible. Prevent fire activity in this area from violating fire management policies and objectives in adjoining areas.

(3) Operational Considerations. Careful monitoring of fire behavior and fire weather conditions is essential within this area. When escape of a fire from this area appears imminent, the IC will implement a strategic control plan using natural and man-made barriers to control the fire.

d. Modified Suppression Management Option (Contain): This option provides for a level of protection between "Full" and "Limited". The intent is to provide the IC with an alternative for those areas that require a relatively high level of protection during critical burning periods, but a lower level of protection when the risks of large damaging fires is diminished. Its intent is to reduce suppression costs and increase resource benefits during the entire fire season through its two distinct operational responses to fire.

(1) Policy. Contain all fires using aggressive initial attack unless otherwise directed by the IC or adjacent landowner upon completion of a modified initial attack analysis. Manage fires to consider resource management objectives in a cost-effective manner.

(2) Objectives. Reduce suppression costs on escaped fires through minimum force commitments and indirect suppression tactics. Allow fire to help achieve land management objectives.

(3) Operational Considerations. When a fire escapes containment, the fire will be evaluated by the IC, using the escaped fire analysis format to determine further fire strategy. Coordinate immediate request for mutual aid assistance to augment fire suppression efforts as required.

5.3. SPECIAL CONSIDERATIONS FOR SUPPRESSION ON USARHAW LANDS.

5.3.1. Minimum Impact Suppression.

a. The Incident Commander (IC) needs to select suppression tactics commensurate with the fire's potential or existing behavior, yet leaving minimal environmental impact. This is referred to as Minimum Impact Suppression Tactics (MIST). Minimum impact suppression is an increased emphasis on suppressing a wildfire while minimizing the effects of suppression measures on the vegetation, soils, and watershed.

b. Minimum impact suppression tactics will not over-ride considerations for safety or containment or control of the wildfire. However, they will be used to the maximum extent possible within these constraints. On USARHAW lands, many fires are fought from pre-existing firelines, firebreaks, or from the air. MIST will not affect these suppression responses.

5.3.2. Methods to Reduce Impacts.

a. Protection of the local environment will be considered in fire management strategies, particularly in the location of fuelbreaks and control lines. Special biological resources will be

protected from fire and suppression activities. They are identified for each installation in Chapter 7 and the respective SOP's.

b. Bulldozers are a useful tool in fire suppression efforts but can have a severe impact on natural and cultural resources. The use of dozers to construct fire-lines within pre-established fuelbreaks provides for safe dozer operations, enhances ground firefighter safety, and causes the least environmental impact, as these areas are pre-approved for vegetation removal. Dozers are used as a means of last resort in fire suppression because of their potential impact on the environment. The use of dozers will be restricted in biologically sensitive areas. Dozer operators will be:

(1) Equipped and trained for wildland fire protection.

(2) Trained in environmental sensitive issues relating to the use of dozers (i.e., long term effects of physical disturbance, potential introduction of alien plants, erosion control, and location of endangered and threatened species populations).

(3) Given natural/cultural resource orientation prior to any work assignment to a FMA.

c. If dozer operators have not been trained on environmental issues, a swamper (escort) who has been trained, will accompany every dozer and mark a path that will have a minimum impact. When fire conditions and safety permits, DPW Environmental personnel trained in basic wildland fire behavior, may be utilized as swampers.

d. Fire managers must be familiar with:

(1) Long term effects of physical ground/vegetation disturbance.

(2) Potential of alien vegetation introduction, through the use of dirty equipment or the creation of invasion routes.

(3) Creation of erosion problems.

(4) Protection of cultural sites.

(5) Limitations on use of fire suppression chemicals (foam and retardant).

e. The aerial use of chemical retardant, fire foam and saltwater will be weighed against the potential for fire damage to sensitive plants.

f. During fire suppression the IC will:

(1) Evaluate each and every suppression activity during planning and strategy sessions to see that they meet minimum impact suppression objectives.

(2) Discuss minimum impact suppression tactics with overhead team during overhead briefings.

(3) Ensure minimum impact suppression tactics are implemented during line construction as well as other environmentally destructive activities.

(4) Consult with environmental staff prior to implementing line construction in sensitive areas, providing time permits and proper personnel are available.

5.3.3. Protection of Natural and Cultural Resources.

a. Aside from human safety and structure protection, natural and cultural resources take highest protection priority. Each FMA SOP includes information about specific natural and cultural resources found there, locations of rare plants, and any special instructions regarding their protection. Specific actions and/or information can be found there.

b. Whenever possible, a red card certified member of the environmental and/or cultural staff shall accompany bulldozers or hand crews constructing fireline in previously undisturbed locations. Minimum impact suppression tactics shall be applied to ensure protection of high valued resources.

5.4. FIRE DETECTION AND REPORTING.

a. Early fire detection is critical to an effective initial attack of wildfires on Army training lands. Any agency, unit leader, or individual noticing a fire is responsible for reporting it as soon as it is detected.

b. Any person witnessing a fire or detecting smoke must report it to the Range Control, the FFD, or PTA Fire Department. Notification of fire managers and responders will be initiated by the first alerted agency.

c. Using military units must report all fires, regardless of size, immediately to Range Control, and in turn, to the appropriate fire department. Upon detection of a fire, unit range Officers in Charge (OIC) will immediately initiate a “cease fire” order and notify Range Control, giving the location and size of the fire. Units will not be allowed to resume training until the fire is extinguished or upon approval by a Range Officer and Senior Fire Officer. Units shall follow the fire reporting and notification procedures that are outlined in the SOP for each respective FMA.

5.5. INITIAL AND EXTENDED ATTACK.

5.5.1. Initial Attack.

a. Every wildfire must receive appropriate initial attack action as defined in the SOP for each FMA (see Appendix 1). The goal of the initial attack actions is to limit damage to values at risk while minimizing burned area and preventing escape of the fire. If any wildfire suppression strategy other than full control is to be utilized in initial attack, the rationale must be documented as part of the Army’s Wildland Fire Incident Report (WFIR).

b. Upon notification that a fire has been detected, Range Control and/or the FFD will dispatch appropriate fire fighting resources to respond to the location of the fire. Upon arrival at the site, fire fighting personnel will assess the fire conditions and determine fire control

strategies, including the equipment and personnel requirements necessary to execute initial attack operations.

c. Once on the fire scene, the initial attack responder or the IC may decide that additional personnel are required to fight the wildfire. Military personnel may assist in initial attack efforts provided they are directly supervised by qualified firefighters and proper personal protective equipment (PPE) has been issued. Once notified, the primary mission of the unit OICs will shift from training to assisting with fire fighting. Once military resources have been committed to fire fighting, they are under the operational control of the IC. This does not preclude unit commanders from rotating personnel and equipment as needed. The IC directs the overall employment of fire fighting resources to control and extinguish the fire.

d. The initial attack individual with the highest level of wildfire qualification/training will act as the initial attack IC until relieved by a higher qualified individual of the fire department. Under normal situations, Range Control personnel will be the first responders until the FFD or PTA Fire Department arrives.

e. The closest forces, (i.e., the nearest available appropriate fire resource) will be used to respond to an incident within a specific FMA. At DMR and KTA, the first responders on scene will often be Honolulu County firefighters. The use of closest resources must be covered by cooperative agreements or memoranda of understanding with adjacent agencies or fire protection organizations.

REFERENCE 5.5.1
COOPERATIVE WILDLAND FIRE FIGHTING RESOURCES

1. Dillingham Military Reservation:

Base Location	Distance	Response Time	Agency
Waialua	7 Miles	15 Minutes	Honolulu City/County
Wahiawa	13 Miles	20 Minutes	Honolulu City/County
Schofield/Wheeler	15 Miles	25 Minutes	FFD

2. Kawailoa Training Area:

Wahiawa	12 Miles	20 Minutes	Honolulu City/County
Schofield/Wheeler	15 Miles	25 Minutes	FFD

3. Kahuku Training Area:

Kahuku	5 Miles	15 Minutes	Honolulu City/County
Wahiawa	25 Miles	35 Minutes	Honolulu City/County
Schofield/Wheeler	30 Miles	40 Minutes	FFD

4. Makua Military Reservation:

Waianae	7 Miles	15 Minutes	Honolulu City/County
Lualualei	15 Miles	25 Minutes	FFD
Kapolei	21 Miles	35 Minutes	Honolulu City/County
Manana	28 Miles	45 Minutes	FFD
Hickam AFB	36 Miles	55 Minutes	Hickam Air Force Base

5. Pohakuloa Training Area:

Waimea	22 Miles	25 Minutes	Hawaii County
Waikaloa	28 Miles	40 Minutes	Hawaii County/DOFAW
Kaumana	34 Miles	60 Minutes	Hawaii County
Hilo	36 Miles	60 Minutes	Hawaii County/DOFAW

6. Schofield Barracks Military Reservation:

Wahiawa	3 Miles	5 Minutes	Honolulu City/County
Mililani	4 Miles	7 Minutes	Honolulu City/County

7. Schofield Barracks East Range

Wahiawa	2 Miles	5 Minutes	Honolulu City/County
Mililani	4 Miles	7 Minutes	Honolulu City/County

5.5.2. Extended Attack.

a. Extended attack occurs when a fire has not been contained or controlled by the initial attack forces and continues until transition to a higher level fire that requires an incident management team, or until the fire has been contained or controlled.

b. Once a fire has expanded beyond the capabilities of the on site resources, or it is apparent that it will exceed these capabilities, the initial attack IC must request assistance. Fire managers must be activated and additional resources must be deployed to expand the suppression assets and fire organization under the Incident Command System (ICS). Extended attack operations require an ICS to be established and can be tailored to the incident. Extended attack action requires an Escaped Fire Situation Analysis to guide the re-evaluation of suppression strategies.

c. Operational decision charts have been developed to assist the initial attack IC in the decision making process upon the onset of a fire being first reported (see References 5.4.2-5.4.5).

5.5.3. Fire Suppression Strategy.

The flow charts on the next several pages illustrate the appropriate actions to be taken given differing fire situations. They are intended to aid the Incident Commander during a wildfire response. The possible wildfire situations are:

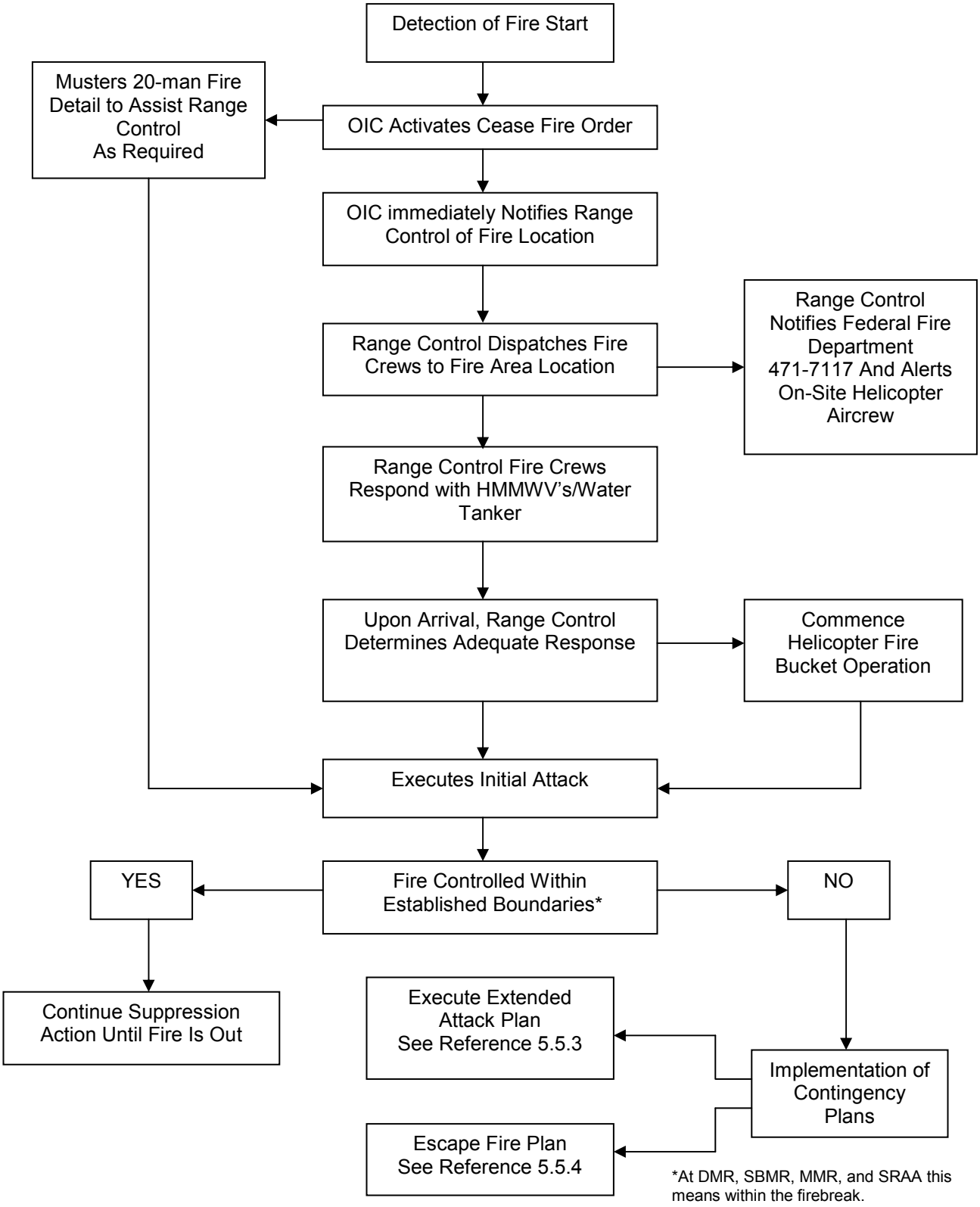
a. **Initial Attack**. This flow chart depicts the decision process designed for resources responding to an initial attack of a wildfire. This chart will aid the Initial Attack IC in responding to a wildfire. See Reference 5.4.2.

b. **Extended Attack**. This flow chart depicts the decision process designed for resources responding to an extended attack of a wildfire. This chart will aid the Extended Attack IC in responding to a wildfire. See Reference 5.4.3.

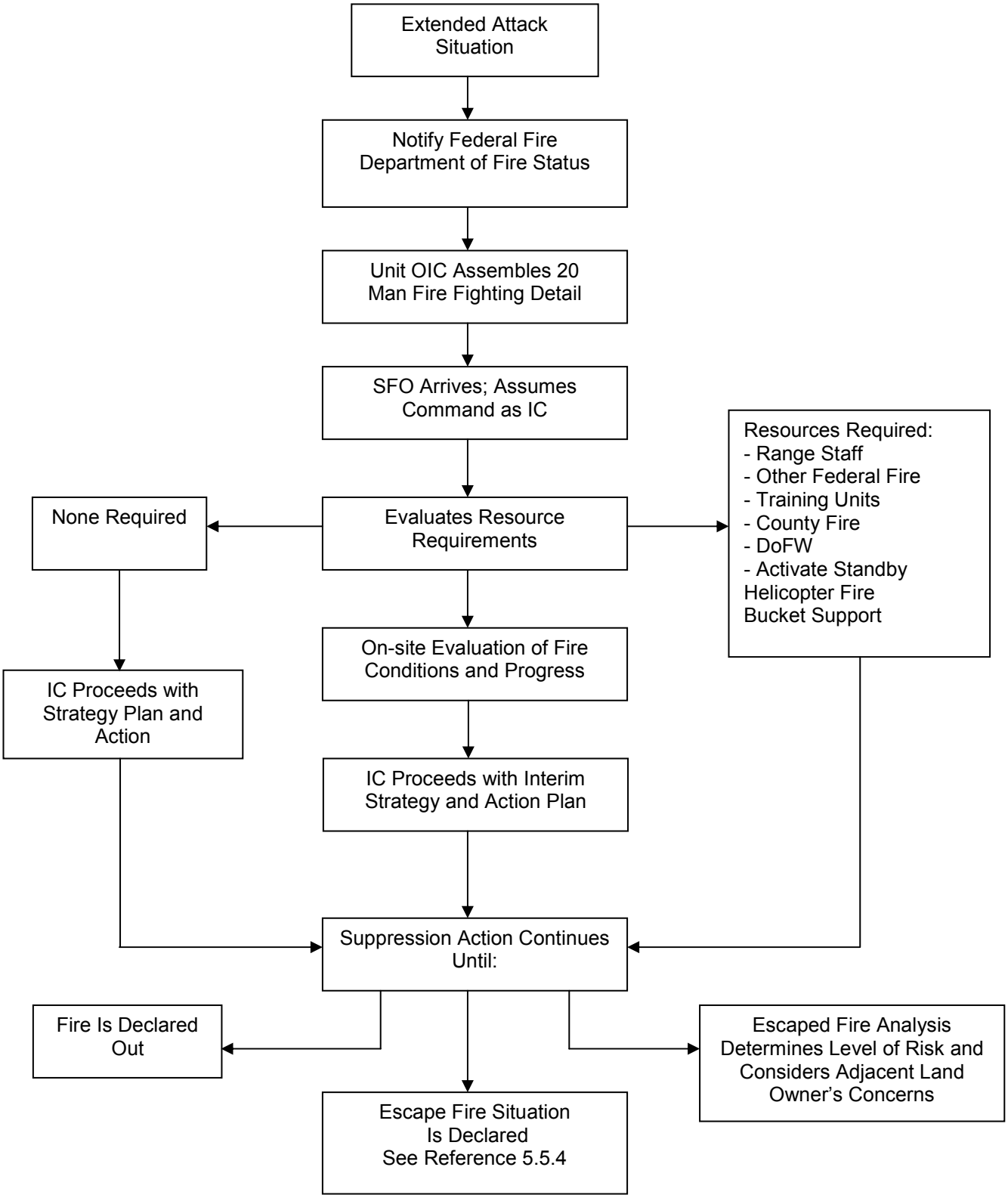
c. **Escaped Fire Situation**. This flow chart depicts the decision process designed for resources responding to an attack of an escaped wildfire. This chart can be used when a fire escapes any control measure. At MMR, SBMR, or DMR an escaped fire is any fire outside of the firebreak. See Reference 5.4.4.

d. **Monitoring Procedures** (Non-Army Fires Outside Of Installation Boundary) This flow chart depicts the decision process designed for resources responding to an initial or extended attack of a wildfire that has started off USARHAW land. See Reference 5.4.5.

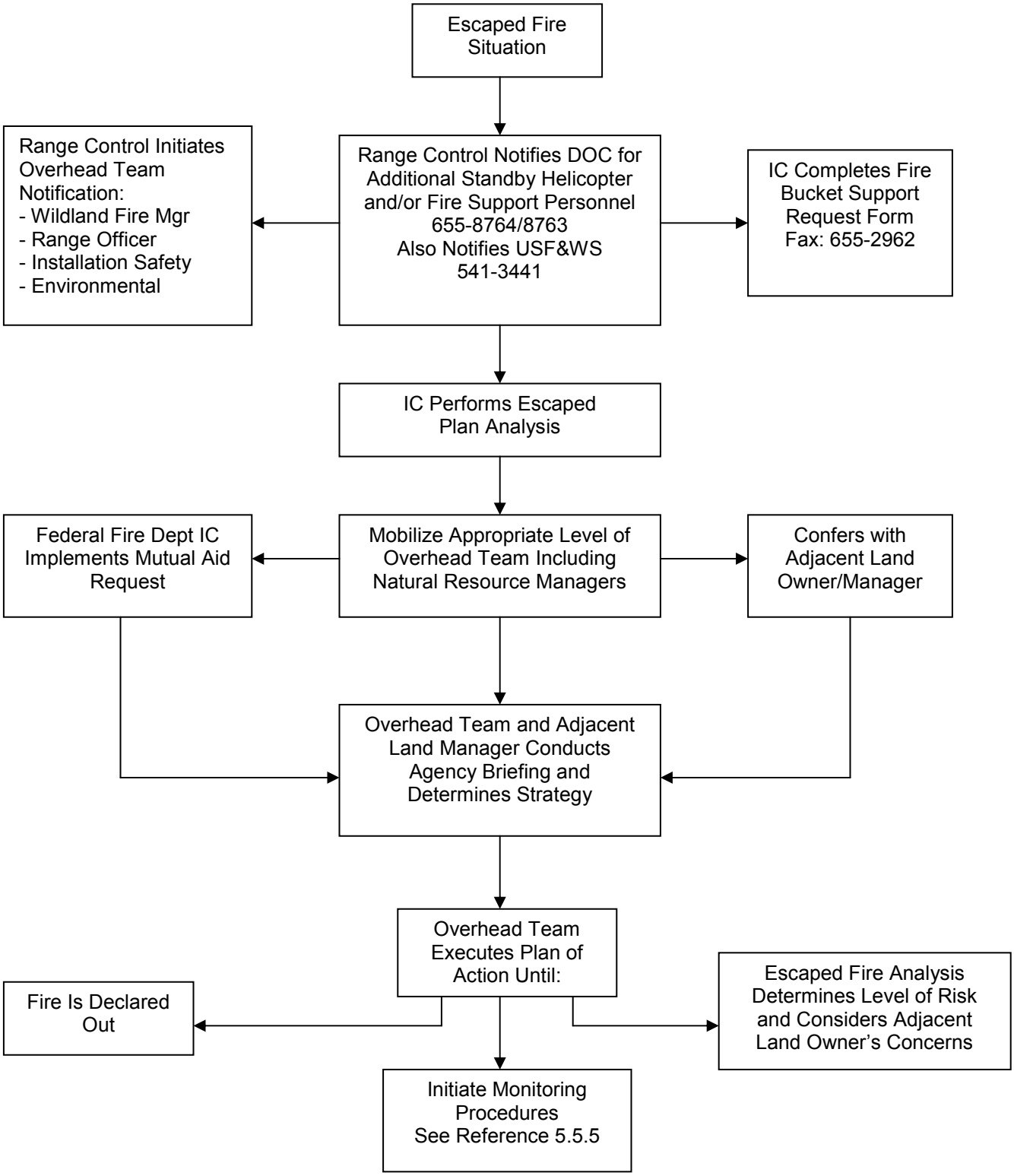
REFERENCE 5.5.2
OPERATIONAL DECISION CHART (INITIAL ATTACK PLAN)



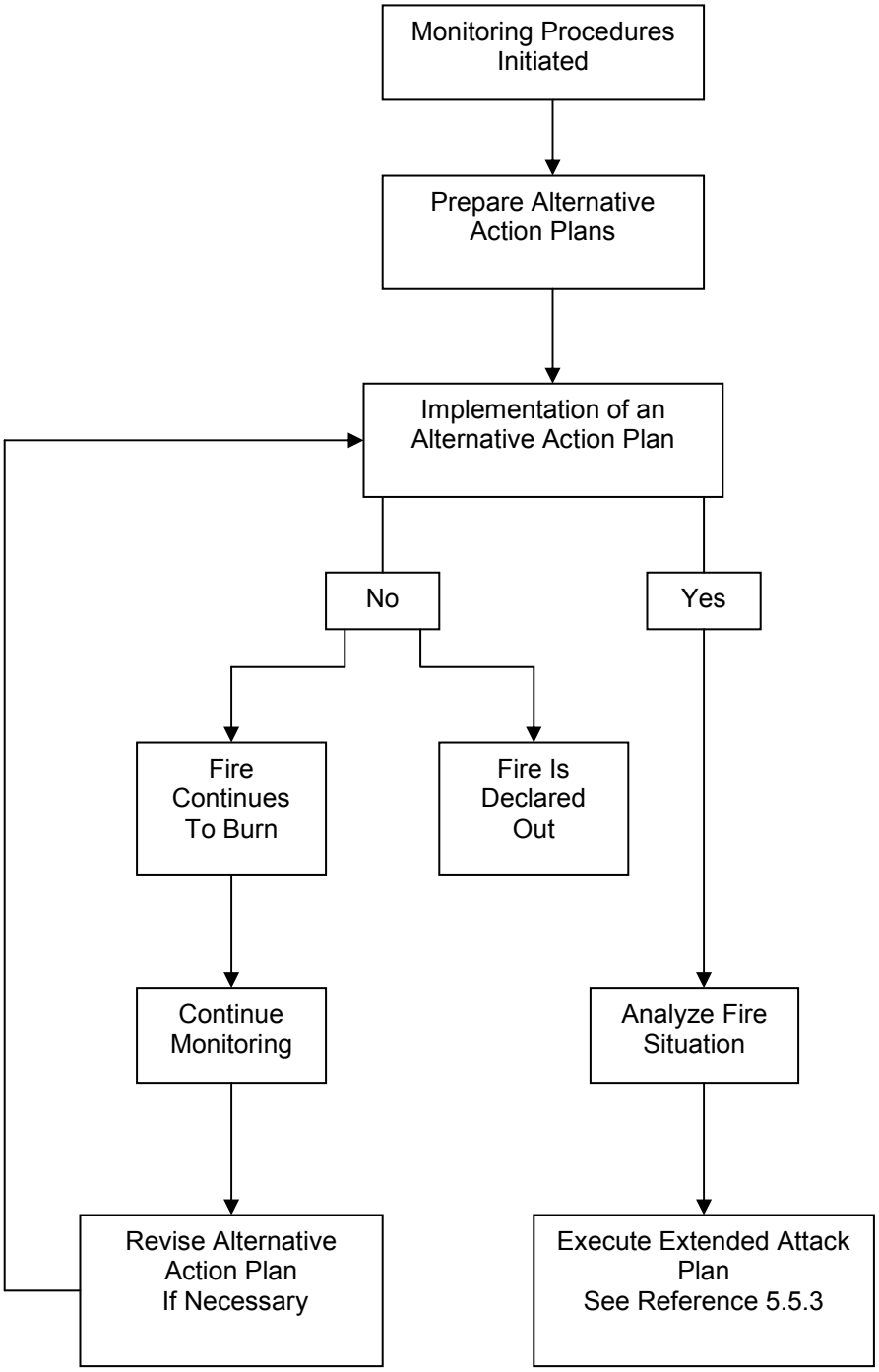
REFERENCE 5.5.3
OPERATIONAL DECISION CHART (EXTENDED ATTACK PLAN)



REFERENCE 5.5.4
OPERATIONAL DECISION CHART (ESCAPE FIRE SITUATION PLAN)



REFERENCE 5.5.5
OPERATIONAL DECISION CHART (MONITORING PROCEDURES)
(FIRES OUTSIDE OF INSTALLATION BOUNDARY)



5.6. COMMUNICATION.

5.6.1. General.

a. Effective fire fighting communications support is based on providing the Incident Commander (IC), with the communications means and procedures that will ensure ability to fulfill the specified fire mission requirements. These requirements must be fulfilled under a variety of conditions. The scope of these conditions involves the following:

1. Ability to conduct routine operations required for normal fire management.

2. Ability to employ and control a wide variety of fire fighting personnel and material resources in the fire suppression effort.

3. Ability to perform (1) and (2) simultaneously within resource limits and degree of fire severity.

4. Ability to coordinate laterally with other Army, government and civilian emergency and fire support agencies in consideration of contingencies which may require mutual effort.

5.6.2. Types of Communications.

a. Telephone is the primary means of communications between fixed agency facilities. Telephone communications are used between the Federal Fire Department (FFD) and other non-mobile units (Range Control, IOC/EOC facilities, etc.) and the FFD Communications Center commonly referred to as “Central”.

b. Radio is the primary means of communications between the fixed base facilities and mobile fire response vehicles, helicopters, or ground forces. Fixed locations possessing radio equipment may use such means (provided if they know the proper radio frequency assignments) as an alternate to telephone, should it fail.

5.6.3. Agencies.

a. USARHAW.

1. The IC may employ a significant amount of multi-agency resources for major fires. Telephone and radio will be the primary means of communication for the ICS. During initial attack, Range Control will establish an internal radio network as the primary means for control and coordination of Range Control or military forces once deployed. Radio will become the primary means of communication should telephone facilities serving these links fail or become inadequate. The USARHAW/USAG-HI Command Network is designed for this purpose and the Area District Fire Chief or IC will request its activation during emergency or natural disasters, if required.

2. Range Control with internal radio equipment assets (portable, air-to-ground) will support the ICS or FFD with radios, if required. Range Control shall maintain continuous operation of the radio network and monitor all radio transmissions during normal duty hours and

any periods of live firing. Range Control must be prepared to transmit information relating to geographical location of fires or other information useful to the IC and fire fighting forces.

b. OTHER AGENCIES. The IC may significantly increase the use of external communications when on base or major off base fires threaten to cross Army installation boundaries. The FFD has radio facilities for external communications on mutual aid radio networks with local, state, and federal agencies.

5.6.4. Radio Networks

a. FEDERAL FIRE DEPARTMENT PRIMARY NETWORK. This provides the means for the Fire Chief and/or Area District Fire Chief to exercise command, control, and administration over all subordinate components of the FFD and agencies/organizations in direct support. It provides the primary means for assignment and dispatch of selected fire fighting support vehicles, forces, and resources. The radio network may function as an alternate to one of the Range Control networks when radio facilities assigned to those networks fail or do not provide adequate radio coverage.

b. RANGE CONTROL PRIMARY RADIO NETWORK. Provides the means for the Range Control Officer to exercise technical control and direction over subordinate components of the Range Control and military training units assigned in direct support. This network may be reassigned to the Area District Fire Chief for his use to function as the Incident Commander. The radio network may function as an alternate to the FFD radio network when radio facilities assigned to that network fail. Range Control Dispatchers will:

(1) Be familiar with the IWFMP and wildfire SOPs.

(2) Know how and who to notify in the event of wildfire.

(3) Know whom to call if additional resources are required.

(4) Ensure emergency radio traffic is kept to a minimum.

(5) Be familiar with documentation and proper entries on the WFIR.

(6) Access weather data.

(7) Dispatch initial attack response crews and activates helicopter support as required.

c. USARHAW/USAG-HI COMMAND RADIO NETWORK. Allows the Installation Commander to exercise command and control over subordinate units, directorates, sub-installations, Disaster Commanders and in the case of a wildfire, the Incident Commander (IC). This network is activated as required for destructive weather, fire, and disaster or emergency conditions. Commanders may be directed to enter this network if such action is required due to circumstances of the emergency. The network control station will be at the Installation Operations Center (IOC)/Emergency Operations Center (EOC) at Schofield Barracks (Oahu) or the Emergency Operations Center (EOC) located at Pohakuloa Training Area (PTA), on the Island of Hawaii. The USARHAW/USAG-HI Command Radio Network is operated over a radio repeater that ensures complete radio coverage of Army installations and most surrounding communities.

5.6.5. Radio Frequencies.

a. INTERAGENCY RADIO FREQUENCY LIST (Oahu). Radio frequency assignment lists on Oahu for Army, Federal Fire Department, Hickam Fire Department, Division of Forestry & Wildlife, City & County of Honolulu Fire Department are listed in Reference 5.6.1.

b. INTERAGENCY RADIO FREQUENCY LIST (Hawaii). Radio frequency assignment lists on the Island of Hawaii for Army, Federal Fire Department, Division of Forestry & Wildlife, National Park Service, Hawaii Volcanoes National Park; and Hawaii County Fire Department are listed in Reference 5.6.3.

REFERENCE 5.6.1
INTERAGENCY RADIO FREQUENCY LIST (OAHU ONLY)

CHNL	TX	RX	AGENCY
CH 1	143.1750	143.1750	Schofield Range Control
CH 1	143.1750	143.1750	Makua Range Control
F1	138.000	138.000	Federal Fire Dept (Removal)
F2	141.000	141.000	Federal Fire Dept
F1	173.260	173.260	Hickam Fire Dept
F2	175.5625	175.5625	Hickam Fire Dept
F1	154.220	154.220	Honolulu Fire Dept
F2	154.340	154.340	Honolulu Fire Dept
F3	154.145	154.145	Honolulu Fire Dept
F4	154.400	154.400	Honolulu Fire Dept
F5	154.280	154.280	Honolulu Fire Dept
SPX	154.995	154.995	State DLNR (DOFAW)
RPT	154.085	154.995	State DLNR (DOFAW)
TAC 1	155.895	154.895	State DLNR (DOFAW)
TAC 2	155.985	155.985	State DLNR (DOFAW)
TAC 3	155.980	155.980	State DLNR (DOFAW)

FM	38.30	Schofield/Makua Range Control (SINGARS) Primary
FM	49.70	Schofield/Makua Range Control (SINGARS) Alternate

REFERENCE 5.6.2
PTA RADIO FREQUENCY LIST (PTA & KMC ONLY)

Army Radio Frequencies or frequencies programmed to Army radios, Hawaii (PTA & KMC). Radio channels/frequencies and owning agencies for USARHAW on Island of Hawaii.

CHNL	TX		RX	PL	Remarks
1	173.5125		173.5125	CSQ	PTA & KMC Admin/DOD Police
2	173.4125		173.4125	CSQ	PTA Range Control
3	173.4625		173.4625	CSQ	PTA & KMC Fire/Ambulance
4	172.500		73.5125	CSQ	Mauna Loa Repeater (Priority 1)
5	172.300		173.4125	CSQ	Mauna Loa Repeater (Priority 2)
6	172.5000	PL3A	173.5125	PL3A	Future Mauna Loa Repeater
7	172.300	PL4A	173.4125	PL4A	Future Mauna Loa Repeater
8	171.3875	PL4A	173.4375	CSQ	Kulani Cone Repeater
9	168.550		168.550	CSQ	National Park Service
10	169.400		168.550	CSQ	National Park Service Repeater
11	156.210		155.310	CSQ	Hawaii County Civil Defense
12	153.950	PL3A	154.385	PL7Z	Kulani Cone (Chan 1) Fire
13	153.890	PL4B	154.310	PL7Z	Sheep Station (Chan 2) Fire
14	153.890	PL1A	154.310	PL7Z	Iolehaehae, Ohia Mill (Chan 2) Fire
15	153.890	PL4Z	153.310	PL7Z	Base Yard, South Point (Chan 2) Fire
16	154.010	PL2Z	154.445	PL7Z	Kapoho, Kahua Ranch (Chan 3) Fire
17	154.010	PL5Z	154.445	PL7Z	Naalehu (Chan 3) Fire
18	153.890	PL3A	154.310	PL7Z	Huehue (Chan 2) Fire
19	153.950	PL7Z	154.385	PL7Z	All Points (Chan 1) Fire
20	153.950	PL6Z	154.385	PL7Z	Haleakala (Chan 1) Fire

VHF	126.300	Bradshaw Tower to Aircraft
FM	41.50	Bradshaw Tower to Aircraft
VHF	121.700	Bradshaw Tower Ground Control
UHF	237.500	Bradshaw Tower Ground Control
FM	38.30	Range Control (SINGARS) Primary
FM	49.70	Range Control (SINGARS) Alternate
VHF	121.650	Bradshaw Airfield Weather (ATIS)

REFERENCE 5.6.3
INTERAGENCY RADIO FREQUENCY LIST (ISLAND OF HAWAII ONLY)

Radio Codes in use on the Big Island (Alphabetical Order)

TX	RX	AGENCY
154.085	154.995	GRN RPT
154.995	154.995	GRN SPX
153.950	154.385	HFD F1
155.950	154.396	HFD F1
153.890	154.310	HFD F2
154.010	154.445	HFD F3
154.130	154.130	HFD T1
154.205	154.205	HFD T2
154.385	154.385	HFD T3
154.310	154.310	HFD T4
154.445	154.445	HFD T5
155.115	155.115	HAWAII LG SPX
169.400	168.550	MAUNA LOA
155.820	155.820	MAUI LG SPX
155.865	155.115	HAWAII LG RPT
154.965	155.820	MLG RPT
169.400	168.550	NAALEHU
168.550	168.550	NPS HVNP
168.350	168.350	NPS KONA
169.400	168.550	PALI
155.895	159.360	TAC 1 RPT
155.895	155.895	TAC 1 SPX
155.985	159.360	TAC 2 RPT
155.985	155.985	TAC 2 SPX
154.980	159.360	TAC 3 RPT
154.980	154.980	TAC 3 SPX
162.400		WEATHER
162.550		WEATHER
155.025	155.715	YEL RPT
155.715	155.715	YEL SPX

REFERENCE 5.6.3 (Cont.)
INTERAGENCY RADIO FREQUENCY LIST (ISLAND OF HAWAII ONLY)

Radio Codes in use on the Big Island (Ascending Order)

TX	RX	AGENCY
153.890	154.310	HFD F2
153.950	154.385	HFD F1
154.010	154.445	HFD F3
154.085	154.995	GRN RPT
154.085	159.360	GRN TRPT
154.130	154.130	HFD T1
154.205	154.205	HFD T2
154.310	154.310	HFD T4
154.385	154.385	HFD T3
154.445	154.445	HFD T5
154.965	155.820	MLG RPT
154.980	159.360	TAC 3 RPT
154.980	154.980	TAC 3 SPX
154.995	154.995	GRN SPX
155.025	155.715	YEL RPT
155.115	155.115	HAWAII LG SPX
155.715	155.715	YEL SPX
155.820	155.820	MAUI LG SPX
155.865	155.115	HAWAII LG RPT
155.895	159.360	TAC 1 RPT
155.895	155.895	TAC 1 SPX
155.950	154.396	HFD F1
155.985	159.360	TAC 2 RPT
155.985	155.985	TAC 2 SPX
162.400		WEATHER
162.550		WEATHER
168.350	168.350	NPS KONA
168.550	168.550	NPS HVNP
169.400	168.550	MAUNA LOA
169.400	168.550	NAALEHU
169.400	168.550	PALI

a. Communication between fire fighting resources on a fire incident is critical to the safe and effective suppression of wildfires. All ground military and civilian resources must be able to communicate with each other, and military and civilian aircraft must have communication with each other and ground resources.

b. The Federal Fire Department maintains a central dispatcher for normal fire protection. Range control maintains a dispatcher (firing desk) whenever there are military training exercises and live-fire activity on the range.

c. During extended attack, an IC will be required to develop a Communication Plan that outlines radio communication requirements for ground and air operations. Radio frequencies of other cooperative agencies shall be made available to the Army for use during mutual aid response. See Section 5.6, Communication Plan.

5.7. AIR OPERATIONS.

5.7.1 Objective.

a. This Aviation Plan establishes policy and procedures for requesting the use of Army military helicopters and Army contracted helicopters capable of providing aerial support during wildland fires on military installations and within the state of Hawaii. The Aviation Plan further outlines the responsibilities required to providing essential logistical support to military helicopters operating fire support missions.

b. Because fire fighting is a secondary duty for all Army aviation assets, response times for aerial assets, though acceptable, are often not ideal. Additionally, Army pilots are often only stationed in Hawaii for 2 to 3 years meaning they have little opportunity to become proficient at aerial fire bucket operations.

(1) The IFSO will explore the possibility of a lease to purchase option of a civilian helicopter for fire fighting duties. This aircraft will have medium lift capabilities in support of aerial fire fighting and search and rescue efforts, and a proven record as a reliable fire fighting aircraft. It will preferably have a water carrying capacity of no less than 1000 gallons (US). This aircraft will not be assigned to duty as the on site aircraft for Makua as its purpose is to provide rapid aerial response to fires anywhere on Oahu.

(2) A pilot(s) will be hired, as an Department of the Army civilian employee of the IFSO, to fly this helicopter on initial attack and extended attack missions throughout USARHAW installations on Oahu and, if necessary, at PTA.

(3) Depending on operating costs, the maintenance package will come from an existing Army contractor already on site or a maintenance package included with the aircraft manufacturer's lease agreement. In addition to the annual lease cost, maintenance package, and manning costs, the IFSO will develop an operating budget that includes class IV (POL). Space for short term aircraft parking, hangar/maintenance, and pilot office facilities will be coordinated until a permanent facility can be established. The pilots and aircrew will be stationed at the proposed new WAAF Fire Station programmed for FY06/7.

5.7.2. REFERENCES.

a. AR 95-1/2/3

b. AR 420-90, Fire Protection, Facilities Engineering.

c. Mutual Aid Fire fighting Agreement (FB5260-93354-903), Dec 93

d. Interservice Support Agreement (N62813-89230-109), Aug 90

e. Joint Services Operations Plan (JSOP), Aug 98

f. PTA External SOP, Aug 96

g. Aviation Brigade GSOP, Appendix 17 (Fire Bucket Operations) to Annex I (Flight Standardization and Training), 1 Mar 98

5.7.3. Aircraft Use.

a. Helicopters are a proven, powerful, multi-mission weapon in the fight against unplanned wildfire(s). Helicopters provide close-in aerial delivery, with rapid refill and return time, to provide essential support to contain a fire and prevent the loss of life, property, and natural/cultural resources from wildfires.

b. Fire Managers use a variety of helicopters to augment ground operations. Fire managers use helicopters in a wide variety of ways:

(1) To suppress fires using aerial fire buckets that deliver water directly on a fire. Water buckets can also be used with Class A fire foam to enhance the suppression properties of the water. Helicopters using aerial buckets augment initial attack ground fire fighting crews where they can most likely be effective and can be applied safely.

(2) To add or strengthen fuel breaks by using aerial fire buckets to deliver water in the path of a fire. Water buckets can be used with fire retardant to enhance the holding properties of the water.

(3) Transport equipment, supplies and hand crews.

(4) Command and control and aerial observations.

c. In some areas, helicopters are required to be on standby to decrease response time while military operations are under way as a risk management/mitigation tool.

d. Aerial operations can utilize Army helicopters, other military services helicopters, other fire agency helicopters, or helicopters under contract to the Army. The pilots of civil contract aircraft must be Office of Aircraft Services (OAS), Department of Interior qualified; Military Airlift Command (MAC) certified. Military aircrews conducting aerial bucket operations must be certified and current in Aviation Task, Perform Fire Bucket Operations, Task 3016 (see Reference 5.7.11).

e. The Army utilizes military helicopters capable of fire bucket operations to combat wildland fires on Army training lands. The military in Hawaii (USARHAW, USMC and HIARNG) has also incorporated a mutual aid agreement to assist other state and local agencies in the combat of wildfires off military installations.

5.7.4. Proponency.

a. The G3, Air is the proponent of this Aviation Plan.

b. Helicopter aviation support units will provide the Range Division Hawaii (RDH) with a list of all pilots and aircrew members that are certified and trained in fire bucket operations and fire suppression application techniques for wildland fires. The list will be submitted to the Army's wildland fire program manager and will be updated quarterly or as required.

5.7.5 Notification.

a. The decision as to which military service should be called (USA, USMC or HIARNG) is the responsibility of the 25th ID(L) & USARHAW Installation Operations Center (IOC).

b. On Oahu military helicopters assigned to conduct fire missions on federal military installations are normally activated by request through the Army's IOC. In turn, the IOC will activate the aviation unit assigned to respond to the fire incident. Military helicopters on training deployments to PTA may be utilized only if the pilots and aircrews are equipped and trained to conduct the specific operations at the higher altitudes found there. Also at PTA, a private helicopter module (helicopter, pilot, and service support) contracted by the Army, is the preferred approach since there are no permanently assigned aircraft there.

c. Authorization. Notification for support from military helicopters will be coordinated through the Chain of Command. Guidelines as to when military helicopters will be used are as follows:

(1) Fire threatens loss of life, property, and natural/cultural resources on military land.

(2) Fire started as a result of military training activity.

(3) Fire started on military property and threatens civilian property or off post resources.

(4) Fire started on civilian property and threatens military property.

(5) Fire has grown in size and requires large lift capacity.

(6) Fire not accessible by ground fire units.

(7) All other fire suppression assets are committed.

(8) Support is provided to another governmental agency (Federal State or County) per a agreement.

(9) Declared Federal or State disaster support.

d. The decision as to which military service or unit will respond is the responsibility of the IOC. Factors to guide the decision include:

(1) Location of the fire.

(2) Helicopter assets available from each service component.

(3) Type aircraft requested.

(4) Fire bucket capacity requirements (gals).

e. Requesting DoD Assets. Military assistance to civil authorities in support of fire fighting operations during emergency disasters may be provided through the established mechanisms identified below:

(1) Mutual Aid Agreement

(2) Commander's Decision

(3) Joint Services Operating Procedures (JSOP)

(4) Federal Response Plan

f. It is important to remember that the lowest level of government shall respond first prior to implementation or plan execution. Mutual aid agreements provide for immediate and limited resources while the JSOP provides for more DoD resources without Presidential Disaster Declaration. See Reference 5.7.6.

g. Once a Presidential Disaster is declared the JSOP and/or mutual aid agreement is negated under the Federal Response Plan (FRP). Federal assistance under FEMA is provided in accordance with a FEMA-State Agreement for Fire Suppression Assistance signed by the Governor and the Regional Director. Costs associated with fire suppression activities may be eligible for reimbursement to the command pursuant to allowable costs approved by the Regional Director to the State. See Reference 5.7.7.

5.7.6. Aircraft Alert Response Schedule.

a. Military aircraft are limited to daylight fire bucket operation missions only[1].

b. Daily unit schedules and alert response times are as follows:

(1) USA[2]	Weekdays	0700-1730	90 minute alert
	Weekends/Holidays	0700-1730	3 hour alert
(2) USMC	Weekdays	0700-1730	90 minute alert
	Weekends/Holidays	0700-1730	3 hour alert
(3) HIARNG	Weekdays	0700-1730	90 minute alert
	Weekends/Holidays	0700-1730	3 hour alert

5.7.7. Command and Control.

a. Command and control of a fire scene will be organized under the Incident Command System (ICS) and as follows:

(1) Fire fighting operations on military property will be coordinated by the Federal Fire Department (FFD).

(2) Fire fighting operations on state, county or city property will be coordinated by the responsible controlling agency of that land; i.e., State Forestry, State Civil Defense, National Park Service, or Civilian Fire Department.

(3) Aircraft in formation, or from the same unit may coordinate internally.

(4) An “Air Attack Boss”, either on the ground or in the air, may be designated to control aircraft for the IC and acts similarly to an air traffic controller to coordinate large numbers of aircraft.

b. Radio Frequencies. A common interagency working radio frequency for “checking in” during a fire will be developed. However, unless otherwise directed, the frequencies listed in Section 5.6, Communication Plan, and the following radio frequencies are to be used by helicopters at the fire scene:

(1) UHF	250.10	Military Aircraft (Internal)
(2) VHF	138.00 Primary	Federal Fire Department 141.00 Alternate
	123.100 TAC Net	Federal Fire Department (Air-to-Ground)
(3) FM	38.30 Primary	Range Control (SB, Makua, PTA)
	40.70 Alternate	

[1] The CG or Bn Cdr of 2-25 Avn Regt has sole authority for NVG use required during night fire bucket missions.
[2] Exception to helicopter use at MMR. See Appendix 1 to Annex A for required response time at MMR.

c. For reasons of both safety and effectiveness, close coordination between air and ground operations is critical. The use of air-to-ground communication is essential. The IC must configure communications so that air to ground and air to air communications can be established. This may require using parties with multiple means of communications to act as relays with aircraft. The IC must prioritize when and where to use air resources to maximize their effectiveness and their value to the ground operations. Aerial operations are most effective in rough terrain areas that are inaccessible by ground fire fighting crews and in areas potentially contaminated by unexploded ordnance.

5.7.8. Aerial Fire Bucket Operations.

a. Military and civilian contracted aircrews can be assigned to conduct fire bucket missions provided that:

(1) The crew is qualified and briefed to conduct the operations.

(2) The aircraft is equipped to carry and operate the aerial fire bucket

(3) The weather meets the requirements for Visual Flight rules (VFR) at he operational area.

b. Currently, the Army maintains the following fire bucket types in its fire cache inventory:

REFERENCE 5.7.1

Fire Bucket "BAMBI™" Model, Capacity, and Weight Specifications

Model No.	Capacity			Gross Weight		Empty Weight	
	US Gal	Imp Gal	Liters	Pounds	Kg	Pounds	Kg
5566	660	550	2498	5725	2602	225	102
HL7600	1998	1665	7562	17115	7780	465	211
3542 (U.S. Marines)	420	350	1590	3667	1667	167	76

c. Normally the owning unit/operation of fire bucket is responsible for recurring maintenance. However, during aerial attack operations, on site Range Control Maintenance personnel shall be responsible for repairs.

REFERENCE 5.7.2

Helicopter Fire Bucket Lift Capacities.

Agency	Aircraft Type	Lift Capacity (Gals)	Bucket Type
US Army	CH-47D "Chinook"	2000	Bambi
	UH-60A "Blackhawk"	660	Bambi
USMC	CH-46E "Sea Knight"	400	Bambi
	CH-53D "Sea Stallion"	400	Bambi
HIARNG	CH-47D "Chinook"	2000	Bambi
	UH-60A "Blackhawk"	660	Bambi
County Fire	Hughes 500/Bell 206	75/110	Bambi
Civilian Contract	Hughes 500	110	Bambi

5.7.9. Execution.

a. All pilots and aircrew members will be certified and trained in fire bucket operations and fire suppression tactics for wildland fires in order to conduct bucket operations to effectively suppress a fire. (See reference 5.7.11).

b. The assigned aircraft will ensure mission briefings, aircrew safety briefs and aircraft preflight are completed in order to meet the assigned mission requirements.

c. Before beginning the mission the information regarding the fire incident will be provided via agency chain of command, in accordance with the Fire Bucket Request Form (5.7.8).

d. Upon arrival at the fire scene, aircraft will attempt airborne and/or ground communication with the command and control agency for an operational briefing. If civilian helicopters are not present or positive radio contact cannot be established, military helicopters will attempt to land in close proximity to the ground Command Post (CP) for a face-to-face brief. The following information should be passed during the operational brief:

(1) Update of fire scene: hazards, fire movement, location of critical sensitive areas, populous and/or structures being threatened by wildfires.

(2) Tactics, strategy and areas of responsibility.

(3) Water resource locations.

(4) Additional helicopters working in the area and location.

(5) Call signs and radio frequencies of airborne and ground fire suppression units.

(6) Other special requirements.

e. In the absence of air to ground radio communication or a safe landing zone for a face to face briefing, military helicopters should adhere to the following:

(1) Work the flanks of the fire from the heel toward the head fire(s).

(2) When combating wildfires off military installations, civilian fire department or contract helicopters have primary responsibility for fire fighting; therefore, military helicopters should stay clear of their operating area.

(3) Avoid approaches that produce downwash in the vicinity of other fire fighting aircraft, vehicles, and personnel.

(4) If the fire presents danger to structures or residential area and additional support appears necessary, establish separation to integrate with other helicopters working the area.

(5) Always remain predictable for enroute, drop, and egress routes.

f. For extended attack or prolonged fire suppression operations, or as directed by the appropriate chain of command, a ground-to-air radio support component may be required for insert to the Command and Control Center or at the fire scene Command Post, to further enhance radio communication.

5.7.10. Unit Responsibilities:

a. Operations Officer: Maintain a current hazards map of all Army training areas. Currency of hazards posted will be confirmed by pilot report on mission debriefings. If more than 30 days have elapsed since the last hazard confirmation, a day recon is required prior to execution of fire bucket operations.

b. Unit Commanders: Ensure that specific crew experience/mix is considered in selecting flight crews for fire bucket operations.

c. Pilot in Command: Overall responsibility for pre-mission planning, water weight/gallons lift capabilities, crew briefings, mission execution and mission abort/safety criteria.

d. Crew Chief: Ensure that cargo hook and fire bucket mechanisms are properly rigged and in functional working order prior to and during fire bucket operations; ensure that aircraft electrical receptacles are inspected. Perform duties for lift/drop coordination and safety as directed by the Pilot in Command.

5.7.11. Qualification/Currency. See Reference 5.7.11.

5.7.12. Aviation Procedures:

a. Pre-mission Planning: Will include specific attention to flight crew qualifications, compliance with the crew endurance program, determination of maximum gallons of water that can be lifted and maximum flight hours on-station.

b. Passengers: Are not permitted on board during fire bucket operations. The Bn Cdr is the sole waiver authority to this restriction.

c. Night vision goggles (NVG) Fire bucket Operations will comply with the following:

(1) NVG fire bucket will be classified as a minimum of "Medium Risk" for operational missions even if mission risk analysis indicates “Low Risk”. For training missions, the actual risk analysis will be used.

(2) AN/AVS-6 NVDs are required for all crew members.

(3) Crew chiefs will be used for all fire bucket operations.

(4) Both landing and searchlight, one with IR Bandpass Filter, will be operational prior to and throughout the mission.

(5) NVG fire bucket missions outside of the Makua Military Range require a day recon and hazards map of fire area and dip sites.

(6) Night unaided fire bucket operations are prohibited

5.7.13. Bucket Specifications:

a. BAMBI BUCKET:

(1) Model #2024: Overall Length with Standard Rigging: 10.5 ft.
Model #8095: Overall Length with Standard Rigging: 14.5 ft.

(2) Standing Height of Bucket: 38"

(3) Recommended maximum water-dumping airspeed: 50 KIAS

(4) Control Head height: 24". CAUTION: To avoid damage to the helicopter, never land vertically on the control head. Allow the bucket to touch down along side of the helicopter and then maintain tension on the suspension lines by moving laterally slightly, thereby keeping the control head at an angle while landing.

(5) Capacity and Weight: (The BAMBI Bucket water capacity is adjustable by setting the FCAS belt to the desired percentage of bucket fill).

REFERENCE 5.7.3

BAMBI Bucket: (Model 2024) Fill Capacities and Gross Weight

Empty Weight	% Fill in U.S. Gallons (8.33 lbs/gal)	Total Gross Weight**
115 lbs	100% / 240 gal	2115 lbs
115 lbs	90% / 216 gal	1915 lbs
115 lbs	80% / 192 gal	1715 lbs
115 lbs	70% / 168 gal	1515 lbs
115 lbs	60% / 144 gal	1315 lbs

** Total Gross Weight includes Bucket Empty Weight

b. GRIFFIN BIG DIPPER BUCKET:

(1) Overall Length with Standard Rigging: 21' 8"

(2) Standing Height of Bucket: 44"

(3) Recommended maximum water-dumping airspeed: 50 KIAS.

(4) Capacity and Weight:

REFERENCE 5.7.4

GRIFFIN Big Dipper Bucket (Model 1250) Fill Capacities and Gross Weight

Empty Weight 198 lbs	Water Fill (8.33 lbs/U.S. gal)	Total Gross Weight**
Limiter Plugs Installed	250 gal	2281 lbs
Limiter Plugs Removed	200 gal	1865 lbs

**Total Gross Weight includes Bucket Empty Weight
Note: 50-lbs must be added to Total Gross Weight if the system's battery is installed (optional).

5.7.14. Special Requirements.

a. On-site Standby Helicopter During Live-fire Training at MMR and Battalion sized training at PTA.

(1) Training units without aviation assets will coordinate tasking through appropriate channels for a standby helicopter to remain on-site during live-fire training at MMR in accordance with range training SOPs.

(2) Standby helicopters will augment ground fire fighting resources during initial attack on wildfires caused by live-fire activities on training ranges. The ability to control the spread of wildfires from the onset and extinguishing wildfires at its earliest will further enhance training opportunities.

b. Water Resource Locations. Water resource locations that are approved and available for training and/or use during emergency fire bucket missions will normally be one or more of the locations identified in this plan (See Reference 5.7.9).

c. Aircraft Call Signs. Unless otherwise designated at the fire scene, aircraft call signs will be as follows:

(1) US Army:

45th Support Group

B Company, 214th Aviation Regiment	CH-47	"Hillclimber".
C Company, 2-25 Aviation Brigade	UH-60	"Wolfpack"

(2) US Marine Corps:

Aviation Support Element (ASE)	CH-53	"Pegasus"

(3) HI Army National Guard:

Army Aviation Support Facility (Oahu)	CH-47	"Imua"
Army Aviation Support Facility (Hilo)	UH-60	"Imua"

d. Transportation of DOD personnel and equipment. This Aviation Plan authorizes in cases where an emergency exists, the requirement to transport DOD fire fighting personnel or required fire equipment to a fire scene by military aircraft IAW AR 420-90, Fire Protection, Facilities Engineering.

e. Fire Bucket After-Action Reports (AAR). Units supporting fire bucket operations will ensure a fire bucket After Action Report form (See Reference 5.7.10) is completed following every mission and routed through appropriate chain of command for correction of any operational discrepancies. All AARs will be forwarded to the IFSO Wildland Fire Manager for final review and evaluation.

5.7.15. Air Operations Safety. All fire bucket missions, training or actual, will adhere to established Naval Aviation Training Operations Standard (NATOPS) restrictions and be supported by sound judgment and common sense. Safety is paramount.

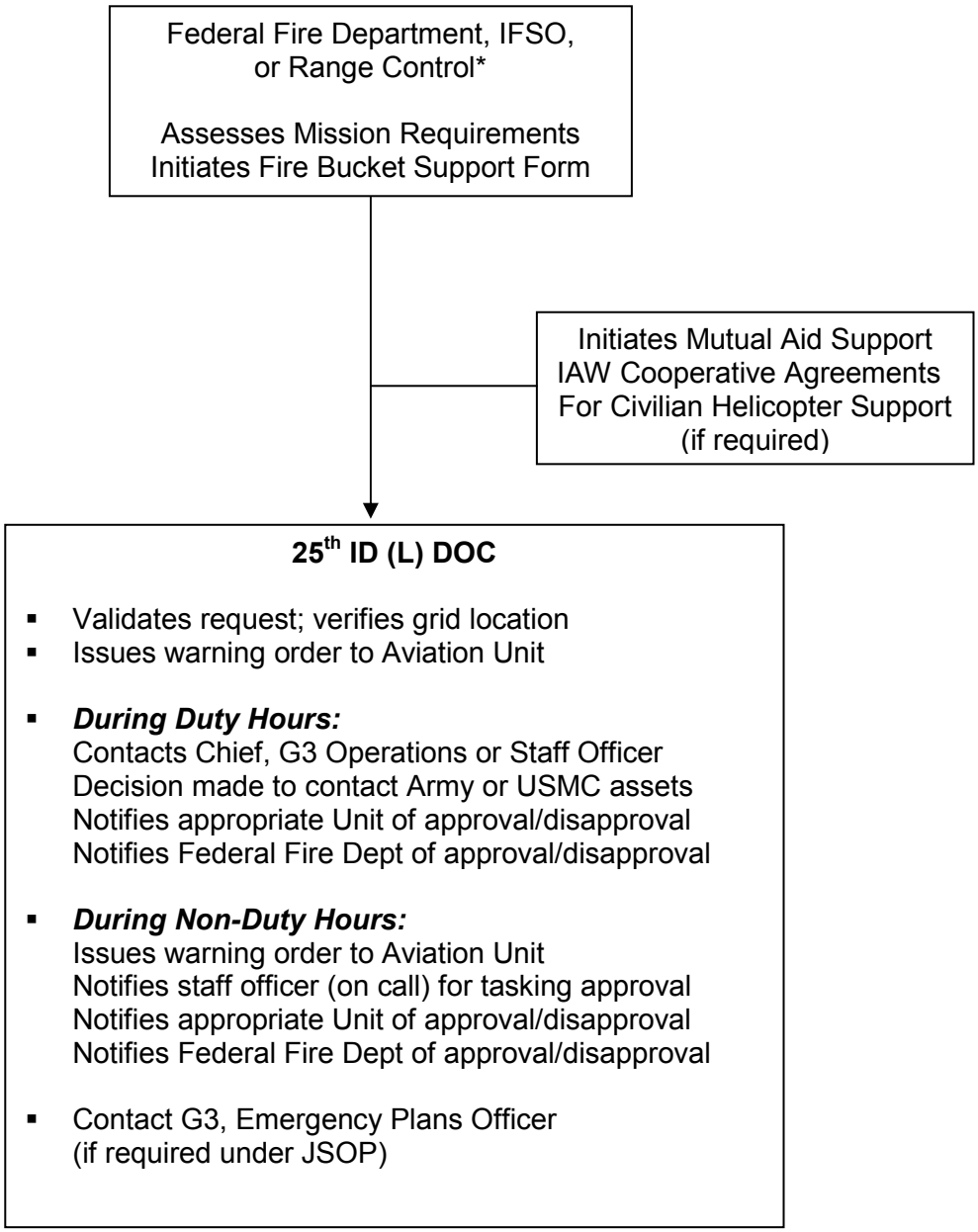
5.7.16. Airspace.

a. All applicable Federal Aviation Administration (FAA) airspace control measures, local air traffic control rules and Army regulations must be followed during aerial fire fighting operations. Federal Air Regulations (FARs) and Army Regulations will be adhered to unless specific coordination has been accomplished by the aircraft commander/pilot in command, mission commander or IC with the local FAA or airspace-controlling agency.

b. Restricted Airspace. Due to the especially high hazards and tight controls associated with military restricted airspace, all aircraft entering restricted airspace must coordinate with the respective controlling agency. Aircraft must contact the controlling FAA or military air traffic control tower, or Range Control, to enter or exit airspace and to obtain specific routes or flights. Operations within USARHAW R-3109 (SBMR), R-3110 (MMR), and R-3103 (PTA) can be coordinated with Range Control.

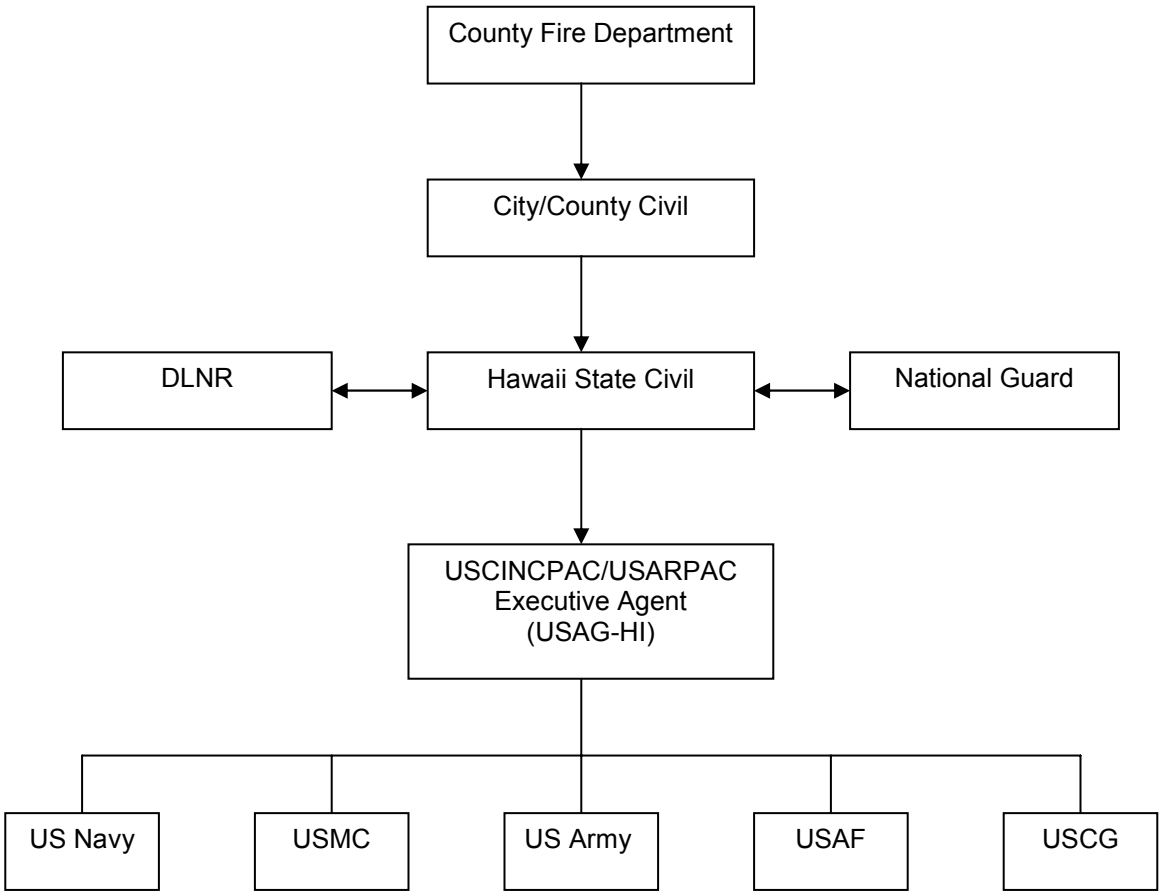
c. During large scale extended attack the IC may establish a special use airspace for aerial fire fighting operations within the restricted military airspace. This must be done in coordination with the controlling agency.

REFERENCE 5.7.5
25th ID(L) & USARHAW FIRE BUCKET SUPPORT COMMUNICATION PLAN
(Fires Started on Military Installations Only)



*Range Control shall have the authority to initiate requests for fire bucket support in the event of imminent threat of fire escape from the military installation boundary.

REFERENCE 5.7.6
REQUESTING DoD ASSETS UNDER JOINT SERVICES OPERATING PROCEDURES (JSOPS) (Pre-Presidential Declaration, Fires Started off Military Installations)



FOR MUTUAL CIVIL EMERGENCY SUPPORT IN THE STATE OF HAWAII

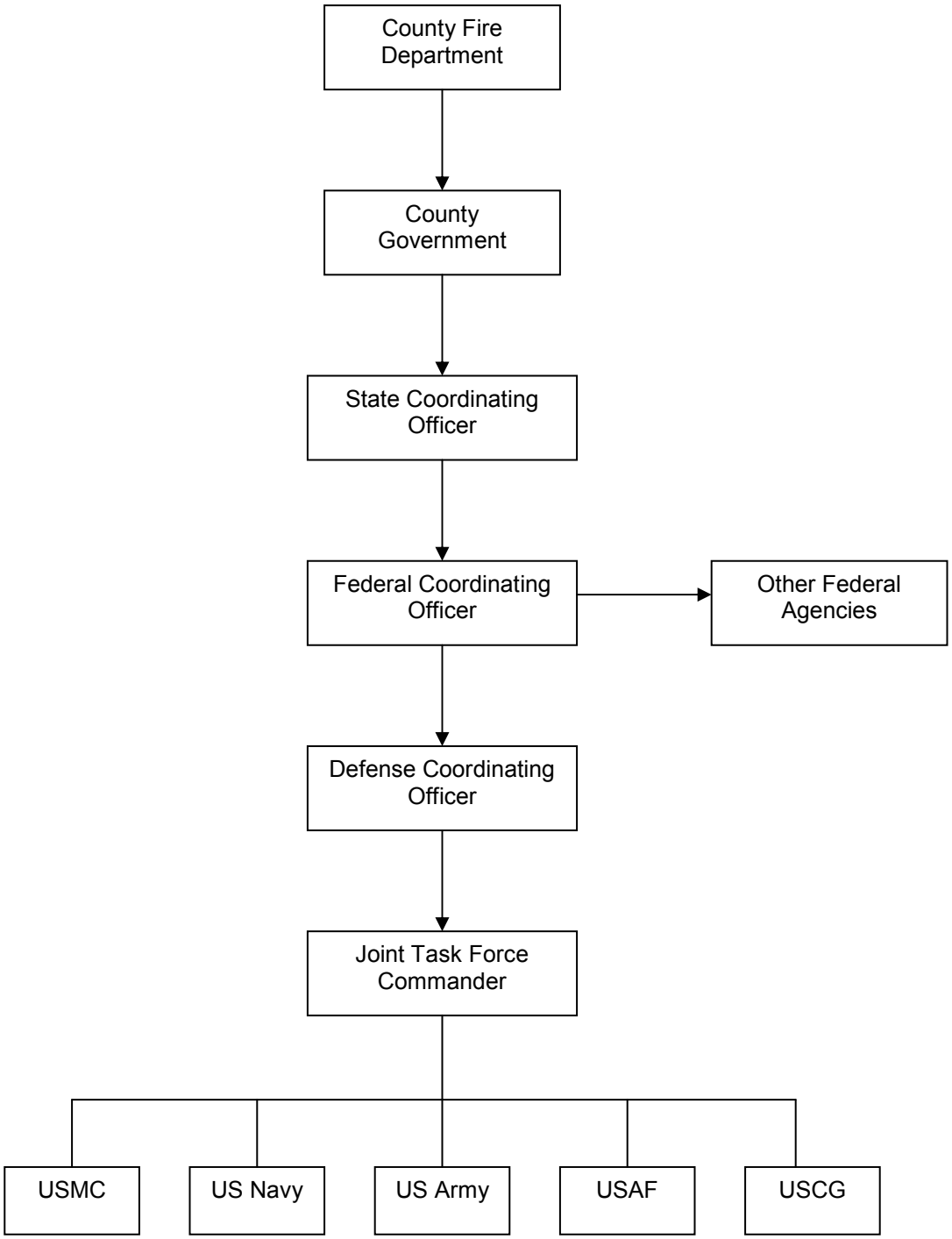
Establishes procedures for responding to requests for Military Support to Civil Authorities (MSCA) without a Presidential Disaster Declaration.

Establishes command relationships.

Provides reimbursement for eligible costs.

Provides hold harmless for claims in providing requested assistance.

REFERENCE 5.7.7
REQUESTING DoD ASSETS UNDER JOINT SERVICES OPERATING PROCEDURES (JSOPS) UNDER FEDERAL RESPONSE PLAN (FRP)
(Presidential Disaster Declaration)



REFERENCE 5.7.8

25th ID(L) & USARHAW Reg 350-1

Request for Rotary Wing Aircraft Support

Date of Request:

REQUEST FOR ROTARY-WINGED AVIATION SUPPORT Proponent of this Form is G3, 25 ID(L) May 97		1. Late Request? Yes / No If Yes, Letter Incl? Yes / No
2. Requesting Unit:	3. POC and Ph# or Freq and Call Sign:	4. Submitted or Coord at AMAC/G3 Conf ? If Yes, Date:
5. Date(s) Required: 5a. Unit's Cycle:	6. Number and Type of Aircraft Requested: 1x UH 60	7. MSC or SEP BN S3 AIR:
8. Pick-Up Point(s)/PZ(s):	9. Destination(s)/LZ(s):	
10. Contact at PZ:	11. Contact at LZ:	
12. Pick-Up Time:	13. Release Time:	
14. Passengers:		
15. Cargo: (type, number, weight)		
16. Special Instructions or Mission Equipment: (e.g. Headphones, Cargo Hook, C2 A/C etc.)		
17. Mission Description: (who, what, when, where, why)		
18. Initial Planning Coordination: (when and where)		
AVIATION USE ONLY		
19. Mission Received From: (name, unit, date, time)		20. Mission Number
21. Mission Passed To: (name, unit, date, time)		
22. Mission Passed To: (name, unit, date, time)		
23. Mission Passed To: (name, unit, date, time)		
24. Number of Aircraft Assigned to Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
25. Estimated Number of Hours for Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
26. Remarks:		

REFERENCE 5.7.9
AERIAL FIRE BUCKET WATER SOURCE LOCATIONS

OAHU TRAINING AREAS:

RESERVOIR	GRID COORDINATES
Ranch 10-B	EJ 895837
Kawailoa 18	FJ 473844
Opaeula 16	FJ 005859
Opaeula 2	FJ 993864
Opaeula 15	FJ 977864
Upper Helemano	EJ 005812
Helemano 11	EJ 971857
Makua Dip Pond 1	EJ 801810
Makua Dip Pond 2	EJ 818809
SBMR Dip Pond (Proposed)	EJ 957783
Kahuku Dip Pond (Proposed)	FJ 985056 (approximate)

POHAKULOA TRAINING AREA:

DIP TANK LOCATION	CAPACITY	GRID COORDINATES
LZ BRAD	80,000 gals	KB 353831
Redleg Trail, Range 9	80,000 gals	KB 333804
Bradshaw AAF	80,000 gals	KB 305872
Puu Maile	80,000 gals	KB 269883
FAARP, Range 17	80,000 gals	KB 249858
Puu Keekee Road	80,000 gals	KB 202866
Keamuku Flow (proposed)	80,000 gals	KB 169918
Old Kona Hwy (proposed)	80,000 gals	KB 172883
MPRC Quarry (proposed)	80,000 gals	KB 142777

REFERENCE 5.7.10
AERIAL FIRE BUCKET AFTER ACTION REPORT FORMAT

XXXX-XX

MEMORANDUM THRU

FOR

SUBJECT: Fire Bucket After Action Report

1. Reference Aviation Plan for Army Helicopter Fire fighting Support

2. The following information is submitted:

   a. Brief description of the incident (include location).

   b. Type/number aircraft involved.

   c. Notification/Launch DTG (Date/Time/Group).

   d. Fire scene arrival/departure DTG.

   e. Total support hours.

   f. Total number of water drops.

   g. Controlling agency on scene.

   h. Remarks (Highlight strengths/weaknesses of event activities and provide recommendations for changes to operating methodology when appropriate.

   i. Estimated Area burnt (acres).

3. The POC is , phone number.

Authenticating Authority

REFERENCE 5.7.11
AVIATION TASK: PERFORM FIRE BUCKET OPERATIONS (TASK 3016)

1. Task: Perform Fire Bucket Operations (TASK 3016)

2. Condition: In a utility helicopter with an operational cargo hook and fire bucket; required briefings and checks completed; and aircraft cleared.

3. Standards:

a. Preflight: the cargo hook IAW the operator's manual and the fire bucket IAW this task's description; brief the crew IAW unit SOP.1

b. Fire bucket Attachment/Hookup: ensure proper rigging and attachment to the aircraft IAW this task's description.

c. Hover:

(1) Maintain ascent heading +/-10 degrees.

(2) Maintain altitude of load 5/10feet AGL, +/-1 foot.

(3) Do not allow drift to exceed 5 ft.

d. Takeoff (below 100 ft AGL):

(1) Maintain takeoff +/-10 degrees.

(2) Maintain ground track alignment with takeoff direction.

(3) Maintain power as required to clear obstacles safely.

e. Takeoff (above 100 ft AGL):

(1) Maintain aircraft in trim.

(2) Maintain airspeed +/-10 KIAS.

(3) Maintain rate of climb +/-100 ft.

f. Enroute:

(1) Maintain aircraft in trim.

(2) Maintain airspeed +/-10 KIAS. (70 KIAS is recommended maximum airspeed).

(3) Maintain safe load obstacle clearance (minimum 50 ft AHO).

(4) Maintain continuous crew coordination to ensure load stability and obstacle clearance.

REFERENCE 5.7.11 (CONT.)
AVIATION TASK: PERFORM FIRE BUCKET OPERATIONS (TASK 3016)

g. In-flight Water Retrieval (Bucket Dipping):

(1) Perform a continuous reconnaissance.

(2) Maintain a constant approach angle to the water reservoir to ensure the load safely clears obstacles.

(3) Maintain ground track alignment with the selected approach path.

(4) Execute a smooth and controlled termination over the water reservoir with load altitude of 5/10 ft AGL, +/-1 foot.

(5) Maintain a vertical descent heading +/-10 degrees and allow the bucket to tip, submerge and fill with water.

(6) Maintain a smooth and controlled vertical ascent; heading +/-10 degrees.

(7) Conduct a hover power check at load altitude of 5/10 ft AGL, +/-1 foot.

(8) Comply with standards for Hover, Takeoff and Enroute Operations as described above.

h. Water Dump/Release:

(1) Maintain continuous crew coordination to ensure load stability and obstacle clearance.

(2) Maintain aircraft in trim.

(3) Maintain airspeed +/-10 KIAS (maximum 50 KIAS for water release).

(4) Maintain safe load obstacle clearance (minimum 50 ft AHO).

i. Landing (for ground refill or bucket derigging):

(1). Execute a smooth and controlled termination over the selected landing site with load altitude 5/10 ft +/-1 foot.

(2) Maintain a vertical descent heading +/-10 degrees and allow bucket to touch down.

(3) Execute a rearward (UH-1) or sideward (UH-60) hover to apply tension to the suspension cables without upsetting bucket stability.

(4) Ensure aircraft clearance.

(5) Execute a smooth and controlled touchdown.

(6) Confirm safe bucket manual refill or derigging

REFERENCE 5.7.11 (CONT.)
AVIATION TASK: PERFORM FIRE BUCKET OPERATIONS (TASK 3016)

j. Perform Correct Crew Coordination Procedures.

k. Preflight:

(1) BAMBI Bucket (fabric construction):

*Check all fabric straps for tears.
*Check side wall battens for loose stitching or bolts.
*Check purse lines on the fabric dump valve for frays.
*Check the FCAS belt for security and condition.
*Check the suspension lines for frays, kinks or twists.
*Check ballast pouch (inside wall), for installation and condition.
*Check control head for secure fittings, cover installed.
*Check electrical cables and connectors for condition.

(2) Griffin Big Dipper (orange urethane construction):

*Check suspension line attachments for condition and security.
*Check urethane bucket for general condition.
*Check suspension lines for frays, kinks or twists.
*Check electrical cables and connectors for condition.

l. Hookup/Attachment: the fire bucket will be rigged for attachment to the helicopter only by certified Range Control personnel and will be supervised for safety by the aircrew.

CAUTION

Ensure the ballast pouch on the "BAMBI" bucket will face forward in flight. This will avoid twisting of the suspension lines and possible jamming of the trip line.

m. In-flight Water Retrieval (Bucket Dipping): Once the bucket touches the water surface it should tip and sink.

WARNING

When filling, do not make abrupt heading or attitude changes. There is a danger that the bucket suspension lines could get tangled or caught on the aircraft and cause dynamic rollover on lift out. The crew chief shall check the load for clearance and safety prior to lift out.

NOTE

The aviator can vary the "BAMBI" bucket's capacity by controlling rate of lift out. As a fully submerged bucket is lifted, water pressure expands the fabric bucket shell, increasing volume. Therefore, a slow lift out gives minimum fill; a fast lift out gives maximum fill. Varying the lift out speed is often the best way to adjust volume, allowing the aviator to vary the load at each fill to best suit the fuel load and prevailing lift conditions. Several fill attempts will be required to gain proficiency. Ensure that aircraft power limitations are not exceeded.

REFERENCE 5.7.11 (CONT.)
AVIATION TASK: PERFORM FIRE BUCKET OPERATIONS (TASK 3016)

n. Water Dump/Release: When over the dump site, press the release mechanism. The dump pattern is most concentrated at lower airspeeds and altitudes and will spread with increased height and speed. Ensure that dumping speed does not exceed 50 KIAS. Press the release mechanism a second time prior to lift out to ensure the release mechanism is in a "locked" position. Consider the effects of wind, airspeed and altitude to make subsequent adjustments for effective dump patterns. Continuous crew coordination is necessary to ensure safe and effective operations.

o. Landing: Proceed as established in the task standard. This procedure is set to clear the bucket and avoid landing on the "BAMBI" bucket's 24" control head.

NOTE

Hover OGE power is required for fire bucket operations

NOTE

The CARGO RELEASE SWITCH will be in the ARMED position for all operations below 300 ft AGL.

NOTE

Before the mission the PC will ensure that all crew members are familiar with hand and arm signals in TC 1-201 and forced landing procedures. In case of a forced landing enroute, the load will be jettisoned. At a hover the aviator will jettison the load if possible and land left of the load. Ground personnel will move right of the aircraft and lie face down. The signal man will lie face down in place.

p. NVG Considerations:

(1) All operations will be conducted IAW unit SOP.

(2) Hovering with minimum drift is difficult and requires proper scanning techniques and crew member coordination. Areas with adequate ground contrast and reference points should be used.

CAUTION

Excessive drift may position the load so it cannot be jettisoned if required.

(3) Treat visual obstacles the same as physical obstacles.

(4) Rates of descent and closure should be slightly slower to avoid abrupt attitude changes at low altitudes.

(5). When flying above terrain flight altitudes, keep in mind the inherent limitations of the NVG; ensure adequate obstacle clearance enroute.

(6) Prior to water dump, avoid target fixation on the fire site by ensuring proper scanning techniques. Avoid restrictions to visibility such as heavy smoke.

REFERENCE 5.7.11 (CONT.)
AVIATION TASK: PERFORM FIRE BUCKET OPERATIONS (TASK 3016)

NOTE

Reference to 5/10 ft hover altitude applies to UH-1/UH-60, respectively.

4. Aviation References:

a. AR 95-1
b. FM 1-203
c. FM 1-204
d. FM 55-450-3
e. TC 1-201
f. Aircraft Operator's Manual

5.8. UNEXPLODED ORDNANCE (UXO).

a. USARHAW uses the range facilities for various forms of live-fire training. Some of the live-fire range facilities are hazardous only during use due to ballistics dangers. These ranges are considered hazardous past the normal use area, (i.e., from the firing line forward to the down range portion, or toward the impact area) during live-fire operations. Access to this down range portion of the live-fire ranges to conduct fire fighting operations is prohibited to all personnel while live firing is taking place. A responding IC must ensure that these ranges are in a "check or cease fire" condition before sending fire suppression forces down range.

b. The explosive hazards inherent with military training on the ranges are multiplied when UXO's are exposed to wildfires. Duds on the ranges and in the training areas and live ammunition or explosives in the possession of military training units on the ranges create extremely hazardous conditions.

c. Due to various types of military ammunition, some range areas are hazardous even after the range has closed for normal live-fire operations due to the probable presence of UXO. These hazardous areas are divided into two categories, those presenting a low hazard to trained, authorized personnel and those containing a high hazard to all personnel.

(1) A low hazard rating means that the government has taken reasonable and prudent measures to reduce the hazard to an acceptable level, consistent with generally accepted standards. This low rating applies only to personnel trained in UXO identification and having appropriate safety courses while they are performing authorized duties, under the direction of their supervisor. The area is considered hazardous to any other person. Authorization to enter low hazardous areas is subject to approval by the range officer, Range Control Safety Technicians, or Explosive Ordnance Disposal (EOD) personnel knowledgeable of hazardous areas. Fire suppression forces will not enter low hazard areas to conduct fire suppression operations down range unless authorized and properly escorted. If proper safety precautions are taken, fire fighting in these areas is approved per Army Reg. DA PAM 386-63.

(2) A high hazard rating means that the government has been unable or it is not feasible to reduce the UXO hazards. The area contains hazards that cannot be mitigated by training or safety measures. All personnel are prohibited from entering hazardous areas without proper authorization. Under no circumstances will firefighters or soldiers enter designated hazard areas to fight fires.

5.9. MUTUAL AID SUPPORT AGREEMENTS.

a. Mutual Aid Support Agreements have been established to provide for multiple agency response and cooperative assistance between fire agencies. Mutual Aid Support Agreements shall be updated and reviewed annually or as required.

b. These agreements provide the instruments to implement cooperative wildland and structural fire fighting response assistance among all of the cooperative departments within the State of Hawaii. Cooperative ground resources normally have well-established procedures and written instructions necessary for quick and effective mutual assistance.

c. Copies of the existing cooperative agreements are provided for review in Appendix 2 of this IWFMP.

d. Cooperating Agencies are:

1. City and County of Honolulu Fire Department (Island of Oahu) is a structural fire department with some wildland fire assets.

2. Hawaii County Fire Department (Island of Hawaii) is a structural fire department with some wildland fire assets.

3. State of Hawaii, Division of Forestry and Wildlife (DOFAW) is a natural resources/forestry management organization with wildland fire assets.

4. National Park Service (Hawaii Volcanoes National Park) is a natural resources management organization with wildland fire assets.

5. U.S. Air Force at Hickam Air Force Base is a structural and crash rescue fire department.

STANDARD FIRE ORDERS AND WATCHOUT SITUATIONS

The 10 Standard Fire Orders were developed in 1957 by a task force studying ways to prevent firefighter injuries and fatalities. Shortly after the Standard Fire Orders were incorporated into firefighter training, the 18 Situations That Shout Watch Out were developed. These 18 situations are more specific and cautionary than the Standard Fire Orders and described situations that expand the 10 points of the Fire Orders. If firefighters follow the 10 Standard Fire Orders and are alerted to the 18 Watch Out Situations, much of the risk of fire fighting can be reduced.

10 STANDARD FIRE ORDERS

Fight fire aggressively but provide for **safety first**.

Initiate all action based on current and expected **fire behavior**.

Recognize current **weather conditions** and obtain forecasts.

Ensure that **instructions** are given and understood.

Obtain current information on **fire status**.

Remain in **communication** with crew members, your supervisor, and adjoining forces.

Determine **safety zones** and **escape routes**.

Establish **lookouts** in potentially hazardous situations.

Retain **control** at all times.

Stay **alert**, keep **calm, think** clearly, and **act** decisively.

18 WATCH OUT SITUATIONS

1. Fire not scouted and sized up.
2. In country not seen in daylight.
3. Safety zones and escape routes not identified.
4. Unfamiliar with weather and local factors influencing fire behavior.
5. Uninformed on strategy, tactics, and hazards.
6. Instructions and assignments not clear.
7. No communication link between crew members and supervisors.
8. Constructing line without safe anchor point.
9. Building line downhill with fire below.
10. Attempting frontal assault on fire.
11. Unburned fuel between you and the fire.
12. Cannot see main fire, not in contact with anyone who can.
13. On a hillside where rolling material can ignite fuel below.
14. Weather gets hotter and drier.
15. Wind increases and/or changes direction.
16. Getting frequent spot fires across the line.
17. Terrain or fuels make escape to safety zones difficult.
18. Feel like taking a nap near fireline

6.1. RECORDS AND REPORTS.

All wildfire incidents will be recorded in accordance with Army record management policy. Documentation of all wildfires is necessary to ensure accurate fire history and to assist fire managers in future fire management planning. The Range Division Wildland Fire Program Manager will maintain all wildfire records. Fire records will be kept in a database as part of long term land management records. It is important that fire records not be disposed of. Fire records will not be subject to Army limitations on record keeping and will be kept indefinitely.

6.1.1. USARHAW Wildland Fire Incident Report.

a. All wildfires on USARHAW land must be reported to Range Control or the Federal Fire Department by the most expeditious means available. Once reported to Range Control, each wildfire incident will be logged in and assigned a fire number and officially documented on the standard USARHAW Wildland Fire Incident Report (WFIR) form. A sample fire incident report form is included in the SOP for each FMA in Chapter 7.

b. The WFIR form is used to track location, size, and cause, and is necessary to compile a fire history and to conduct fire trend analysis for future input and use in Geographical Information Systems (GIS). The use of GIS software will enable the wildland fire manager to store, analyze, and display multiple layers of geographic information. GIS technology provides another tool for analyzing fire historical data that identifies when and where fires occurred, how many acres burned, the cost, and how they were started.

c. The Range Operations supervisor will review all WFIR forms for accuracy and proper completion. When complete, the WFIR form is submitted to the Wildland Fire Program Manager within 24 hours of the conclusion of the incident. The Wildland Fire Program Manager will store all WFIR forms for recordkeeping.

d. WFIR forms are required to be forwarded immediately to the Wildland Fire Program Manager and the IFSO when four or more hectares (10 acres) have burned and/or when unusual events have occurred, including:

(1) All fires escaping or starting outside designated firebreak roads.

(2) Damage to or loss of property exceeding $1000.00.

(3) Damage to or loss of an environmental BSA, SEA, or threatened or endangered specie. In this event, a report must also be sent to the DPW Environmental Office. The Chief of the Environmental Office shall decide if the report needs to be immediately forwarded to the USFWS.

(4) All personnel entrapments or fire shelter deployments.

(5) Major injuries or fire fatalities, or when emergency rescue operations are conducted.

(6) Failure to follow range SOPs or policy.

6.1.2. Federal Fire Department Reports. The Federal Fire Department will submit incident reports completed in the appropriate format, as determined the FFD, to the Wildland Fire Program Manager after each incident for compiling and storage.

6.1.3. Fire Report to U.S. Fish & Wildlife Service (USFWS).

a. The DPW Environmental Office will submit a wildland fire report summary to the USFWS no later than 10 January and 10 July of each calendar year that includes fire reports for every fire that occurred in the last six months on USARHAW lands. In addition, records and reports for all fire incidents within or near BSA/SEA shall be shared with the USFWS as soon as possible after a fire.

b. Prescribed fire annual evaluation and review will be submitted to the USFWS.

6.2. REVIEWS & FORMAL INVESTIGATIONS.

6.2.1. Informal Reviews.

a. All wildland and prescribed fires will be informally reviewed. All informal reviews will be conducted as constructive critiques aimed at determining the facts related to the specific fire. Reviews are intended to resolve operational issues, not impose punitive actions. Reviews are also conducted for the following purposes:

(1) To examine the progress of an ongoing fire incident and to confirm effectiveness of decisions or to correct deficiencies.

(2) To identify new or improved procedures, techniques, or tactics.

(3) To determine the cost effectiveness of a fire operation.

b. Informal reviews can be conducted by the Range Officer and/or the Wildland Fire Program Manager and will serve as sufficient documentation of an informal review on fires less than four hectares (ten acres) in which no unusual events occurred.

c. After Action Reviews (AAR). Following a major wildfire incident, the Wildland Fire Program Manager may conduct an AAR immediately after containing the fire. The AAR may be included as a portion of the WFIR.

6.2.2. Formal Investigations.

a. The Installation Commander will decide at the conclusion of any major incidents if a formal investigation is necessary. The commander may base this decision on advice or recommendations from the fire investigator(s), the Range Officer, the Provost Marshal, the Staff Judge Advocate, Inspector General, or the Chief of the Environmental office. If the Installation Commander deems a formal investigation is required, an investigating officer or review board shall be assigned to conduct a formal investigation. Formal investigations will be done in accordance with Army Regulation (AR) 15-6, "Procedures for Investigating Officers and Board Officers". The Installation Commander shall review the findings and recommendations of the assigned investigating officer or review board.

b. Normal post-fire investigations (similar to structural fires) may be conducted by the Wildland Fire Program Manager, the IFSO (acting as the Command Fire Marshal), or the Federal Fire Chief. All three offices should act together to form a team to investigate and determine the cause of the fire. A qualified fire investigating officer should head this investigation team.

6.3 POST-FIRE ANALYSIS.

6.3.1. Surveys.

a. Besides reports and reviews that are completed after a wildfire, a post-fire survey of the burned area may be required depending on the fire's location and vegetation damaged. The post-fire analysis may be combined with any of the informal or formal investigations. A post-fire analysis will need to determine either all or some of the following:

(1) The effect the fire may have had on native or alien natural flora and fauna resources and cultural resources.

(2) The effectiveness of the pre-suppression measures to include fuels modifications.

(3) The effectiveness of the suppression measures used.

(4) The effectiveness of the ICS.

(5) The effectiveness of fire/fuel models used.

(6) Safety review of suppression actions.

(7) UXO contamination or potential for UXO clean up operations.

b. A post-fire survey of the fire area will be conducted with the coordination of the DPW Environmental and ITAM offices.

c. The effects of fire on threatened and endangered species or effects from catastrophic fire events must be surveyed at the earliest possible time. Soliciting support from other cooperators or contracting subject matter experts is highly encouraged due to limited staffing and fire technical expertise available within USARHAW.

d. If during the survey it becomes evident that a wildfire has affected a BSA/SEA or threatened any endangered species, the USFWS and the State of Hawaii DOFAW will be notified. If the wildfire was determined to be caused by military activities, then the Army will reinitiate Section 7 consultation under the ESA.

e. If a UXO survey is desired, then coordination with the Explosive Ordnance Disposal unit is necessary. Surveys must be planned and coordinated and should be done immediately after a fire.

6.3.2. Analysis. Post-fire analysis will be made to determine the effects of the fire. This analysis can be long term and be incorporated into normal land/natural resource condition studies. Data should be gathered to the extent possible and shared with other cooperating agencies to better understand the fire ecology within the FMAs.

6.3.3. Post-Fire Restoration. Large fires may require post-fire restoration, rehabilitation, and revegetation. Large scale revegetation of burned areas is not feasible. There is currently no available data on successful revegetation of a burned area in Hawaii. Revegetation of selected locations and for experimental purposes may be attempted. Initiatives for study include conducting research into the possible use of less flammable vegetation along burned fire/fuelbreak roads to help expand the fuelbreaks and reduce the risk of fires escaping.

7.1. GENERAL DESCRIPTION OF FIRE MANAGEMENT AREAS (FMA)

7.1.1. General.

a. This chapter is an introduction to each of the FMA SOP's in Appendix 1. It gives a general description of each FMA and discusses current fire issues and management measures, while the SOP is intended to be removed from the IWFMP and used by the IC as a guidance document during suppression operations. The IWFMP SOP will also be included as an annex in the Range Division Hawaii training SOP for each area. Chapter 7 focuses on pre-suppression and planning, while the SOP focuses on suppression of wildfires and decision making.

b. The USARHAW has seven installations on two islands in the State of Hawaii and is in the process of purchasing additional lands on both islands. Each installation is considered one FMA.

7.1.2. Oahu FMAs. Training areas on Oahu are distributed throughout the island. While stationed on Oahu, military units concentrate on tactical maneuver training and individual weapons qualifications. Two of these training areas, SBMR and MMR, support up to company size live-fire maneuver training. If it is purchased, SRAA will include a qualification live-fire range as well. Oahu also is home to several sites for maneuver training: DMR, KLOA, KTA, MMR, SBER, SBMR, and, if purchased, SRAA. All of these training areas are limited in respect to training capacity due to limited size and various training restrictions. They provide either maneuver space or live-fire capabilities, few offer both. The acreage listed within the described areas, are acres available for maneuver training and do not include impact areas, cantonment areas, and other areas restricted by environmental and archaeological issues.

a. Dillingham Military Reservation (DMR) is comprised of 269 hectares (664 acres). Two-hundred twenty-three hectares (550 acres) are fee simple, 32 hectares (78 acres) are ceded, 12 hectares (30 acres) are easement, and 3 hectares (7 acres) are by license. The runway and parking areas (35 hectares) are leased to the State of Hawaii Department of Transportation. DMR is used for Command Post Exercise (CPX) operations, Emergency Deployment Readiness Exercise (EDRES), limited maneuver training, equipment and personnel parachute operations, lodgment support operations and Night Vision Goggles (NVG) training for helicopter pilots.

b. Kahuku Training Area (KTA) is comprised of 3808 hectares (9,409 acres), 3335 hectares (8241 acres) are owned in fee. The remaining 465 hectares (1,150 acres) are leased from the State of Hawaii. This is prime maneuver training area, rugged, mountainous, and suitable for light infantry training. It is adequate for brigade task force training and evaluations. Training is restricted to blank ammunition, limited pyrotechnics, and limited digging. The addition of SBCT will add a MOUT Facility that will include the use of short range training ammunition (SRTA).

c. Kawailoa Training Area (KLOA) is comprised of 9449 hectares (23,348 acres) of leased land. Leases include 7532 hectares (18,613 acres) from Dole Foods Co., Inc., 140 hectares (345 acres) are leased from Attractions Hawaii, and 1777 hectares (4,390 acres) from the State of Hawaii. This is very rugged terrain used primarily for small infantry unit maneuver and helicopter training including Nap of the Earth (NOE) flights.

d. Makua Military Reservation (MMR), Pilila'au Range Complex, is comprised of 1696 hectares (4,190 acres). Of this, 69 hectares (170 acres) are fee simple, 1310 hectares (3,236 acres) are ceded, and 316 hectares (782 acres) are leased from the State of Hawaii. Makua is the premier live-fire maneuver area on the island and is capable of company plus size live-fire activities. It can handle all infantry battalion weapon systems and weapons assigned to USARHAW as outlined in the MMR Range SOP.

e. Schofield Barracks East Range (SBER) is comprised of 2086 ceded hectares (5,154 acres). It is extensively used for tactical maneuver training, infantry training and testing, land navigation training, equipment and personnel parachute operations, NCO Academy training, and courses of instruction offered by the Light Infantry Training Command- Air Assault School, Ranger Indoctrination Program, Light Fighter Course, Light Leader Course, and Pacific Warrior Course. The easternmost portion of East Range is rugged terrain and is used for small unit maneuvers.

f. Schofield Barracks Military Reservation (SBMR) is comprised of roughly 3506 ceded and fee hectares (8,663 acres). A 1133 hectare (2,800 acre) range and impact area dominates Schofield Barracks training area. This is the primary individual and crew weapons qualification area in Hawaii. The range area will support limited artillery firing. High explosive weapons and demolition may be used in this area as well. A small southern area will support limited small unit or support element tasks.

g. South Range Acquisition Area (SRAA) may be purchased by USARHAW sometime in the next several years but does not currently exist. It consist of roughly 810 hectares (2,000 acres) on which one qualification range will be built along with associated infrastructure. Limited maneuver training will be conducted there as well.

7.1.3. Island of Hawaii (The Big Island). Pohakuloa Training Area (PTA) is comprised of 44,026 hectares (108,792 acres). There are 34,323 hectares (84,815 acres) of ceded land, 9694 hectares (23,954 acres) are leased from the State, Smart Trust, and Mauna Kea Properties, and 9 hectares (23 acres) are easement. PTA is a major training area on the Island of Hawaii, 321 km (200 miles) southeast of Oahu. The large size and isolation allow the 25th ID(L) to fire all of its weapon systems including artillery to their maximum range. The maneuver area supports up to a brigade task force. It is considered a high altitude training area at 2,428m plus (6,000 ft) elevation. Geographical separation provides the Division with surface/air deployment opportunities. The Keamuku Parcel, an additional 9,307 hectares (23,000 acres), may be purchased to the northwest of the existing training area. This will support off road maneuver and force on force exercises for SBCT.

7.2. DILLINGHAM MILITARY RESERVATION (DMR)

7.2.1. General Description.

a. Location and Size. Dillingham Military Reservation (DMR) is located on the northwestern tip of Oahu, on the north shore just east of Kaena Point. DMR is located approximately 4 miles west of the town of Wailua. Sole access is via Farrington Highway. The installation is bounded on the north by the Pacific Ocean, on the east by agricultural land, on the south by the northeastern slopes of the Waianae Mountains, and on the west by an abandoned quarry. DMR is comprised of 269 hectares (665 acres), of which 31 hectares (78 acres) are ceded, 12 hectares (30 acres) are easement, 223 hectares (550 acres) are fee simple, and 3 hectares (7 acres) are by license. Portions of the reservation, including the runway and parking area, have been leased to the Hawaiian Department of Transportation (DOT) since 1983 for civilian light aircraft operations and support. The 35 hectares (87 acres) providing for joint civilian and military use as an airfield are in the process of being conveyed to the state of Hawaii.

b. Military Land Use. Approximately 143 ha (354 acres) are suitable for maneuver and field training, 43 ha (107 acres) are developed within the cantonment area, and the remaining 82 ha (203 acres) are located on steep slopes of the Waianae Mountains. Ammunition is restricted to the use of blanks and is prohibited on the runway. Non-aerial smoke is allowed in designated areas, but is prohibited on the runway. Maneuver training is not permitted on the portion of the airfield that is leased to the state of Hawaii unless prior state approval is obtained. There are no live-fire activities, designated impact areas, or associated surface danger zones on DMR.

c. Training Capabilities. DMR is used for small unit (platoon and squad) maneuvers and combat support operations. DMR supports field training for headquarters and service support units. Specific training includes Command Post Exercise operations, Emergency Deployment Readiness Exercise support operations, limited maneuver training, airborne operations including equipment and personnel parachute operations, lodgment support operations, and night vision goggle training for helicopter pilots. Platoon-level Army Training Evaluation Program missions are supported at DMR.

d. Climate.

(1) Rainfall. The average annual rainfall ranges from 51 to 76cm (20 to 30 inches). The monthly average rainfall ranges from 2.5cm (1.0 inch) in the summer to 12.7cm (5.0 inches) in the winter.

(2) Temperature. The average high temperature, as measured in Haleiwa, is 83 degrees Fahrenheit.

(3) Relative Humidity. No records exist from which to determine RH.

(4) Wind. Prevailing winds are east or northeasterly trade winds from 4 to 24 mph in the warm summer months, and light south to southwesterly winds prevail in the wet winter months.

e. Topography. DMR is located on the Waialua Plain and abuts the coast to the north and steep sloping cliffs to the south. The elevation of DMR ranges from sea level along the northern coastal boundary to 809m (2000 ft) in the southern ridgeline areas, but the floor of the airfield is

4 to 48.5m (10 to 120 ft) in elevation. The shoreline topography in the north contains reefs with sand pockets and channels.

7.2.2. Vegetation Fuels Classification. The wildland fire fuel types found at DMR have been categorized into six classes (Figure 2 and Table 7.2.1). These classes were derived from the National Forest Fire Laboratory (NFFL) fuel behavior models as defined by Anderson (1982). For a full description of Oahu fuel types and their derivation see Section 3.5.

Table 7.2.1
Fuel Types at DMR

Fuel Type	*Fuel Model*	*Vegetation Classifications Included (Genus only)*
Short Alien Grassland	NFFL 2	*Andropogon*
Tall Alien Grassland	Guinea Grass Custom	*Leucaena/Panicum, Melinis/Panicum, Panicum*
Eucalyptus Forest	NFFL 10	*Eucalyptus, Melaleuca*
Ironwood Forest	NFFL 9	*Casuarina*
Mixed Forest	NFFL 8	*Metrosideros/Acacia koa/Dicranopteris*
Developed/Denuded	None	*Agriculture, Urban Development, Bog, Open Water, Roads*

7.2.3. Fire History for DMR.

There are records for only two fires at DMR since 1996. Both fires occurred in training area P-1. They burned a total of 2.5 hectares (6 acres) and were both caused by pyrotechnics. The paucity of data precludes analysis.

7.2.4. Resource Protection.

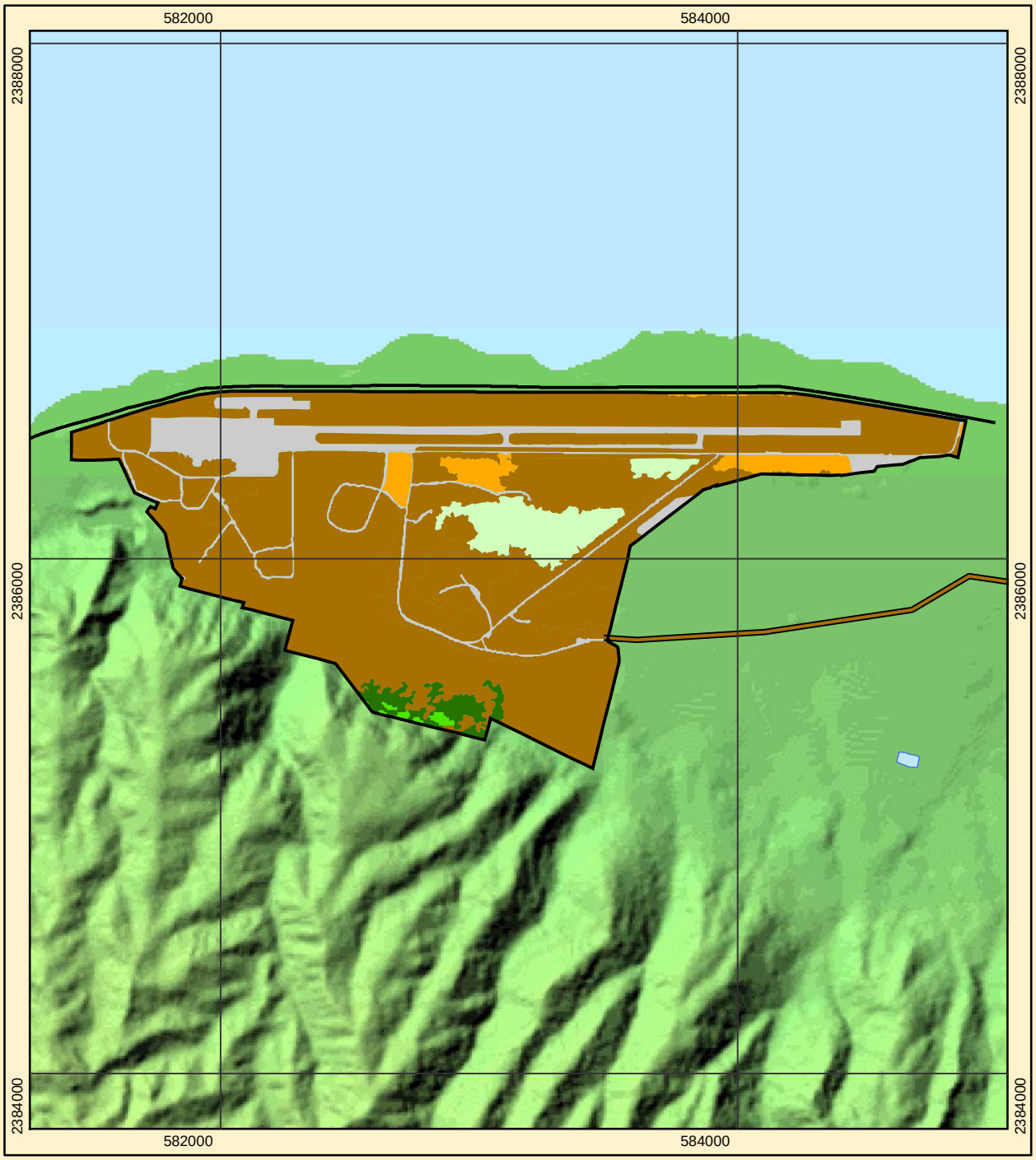
a. Biological Sensitive Areas (BSA). The predominant vegetation at DMR consists of Guinea grass (*Panicum maximum*), lantana (*Lantana camara*), koa haole (*Leucaena leucocephala*), klu (*Acacia farnesiana*), panni (*Opuntia ficus-indica*), ‘ilima (*Sida fallax*), and Natal redtop grass (*Rhynchetytrum repens*). Stands of native forest and shrubland vegetation occur on the cliffs and talus slopes in the southwestern area. Two native natural communities have been identified at Dillingham Airfield, including the cliff ecological zone that is considered rare and globally imperiled. BSA-1 and BSA-3 areas have been delineated at DMR to assist in setting resource management priorities. They are located in a steep cliff area along the central southern boundary of the installation (See Figure DMR-2 in the Appendix 1, DMR SOP).

b. Protected Species. There are no federally protected species within DMR[1].

[1] Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.

Dillingham Military Reservation
Fuels

Figure 2



1:24,000

0 500 1,000 Meters

0 0.5 1 Mile

Legend

Fuels

- Christmas Berry Shrublands
- Developed/Denuded
- Eucalyptus Forest
- Ironwood Forest
- Mixed Forest
- Tall Alien Grassland

- Installation Boundary
- Surface Water Body
- Primary Roads
- Military Vehicle Trail

Data Source: Center for Environmental Management of Military Lands 2003
IKONOS 4 meter Multispectral Imagery

c. Cultural Resources. Archaeological work within DMR boundaries has been limited, although 16 cultural resource sites have been surveyed. There is also a high potential for subsurface sites.

(1) There is an extensive complex of agricultural and occupation features in the rocky sloping area between the airfield and the cliffs. Pre- and post-contact cultural features include platforms, boulder alignments, stone piles, walls, a ditch, and concrete foundations. Three heiau temples, two fishing shrines, and "hidden waters" associated with Hawaiian legend have been identified. The coastal dune areas were used for burial during the pre-contact period. There are also World War II era buildings that have not been inventoried.

(2) There is a high likelihood that areas of DMR with Jaucas Sand contain human remains. Based on cultural deposits observed in the cut bank of Polipoli River, there is moderate potential for subsurface cultural resources. The southern area of the training area has remained relatively intact and therefore has a high probability for cultural resources. An archaeological management area has been delineated along the central southern boundary of the installation.

(3) Pre-contact habitation or agricultural deposits both on and below the surface may qualify under Criterion D of the NHPA as resources that "have yielded, or may be likely to yield, information important in prehistory or history." If human burials exist within sand deposits at DMR, they would be considered significant and eligible for inclusion in the NRHP as "properties of traditional religious and cultural importance."

(4) Finally, historic buildings associated with World War II at DMR may be considered significant under Criterion A as resources that "are associated with events that have made a significant contribution to the broad patterns of our history."

d. Wildfire Prevention Analysis

(1) Five wildfire units have been designated based on the location of existing roads. Each unit was assigned an ignition potential, hazard, and value based upon the best currently available information (see Section 4.2.6 for further information on wildfire prevention analyses). The resulting Pre-Suppression Priority map (Figure 3) shows that the central area of DMR, known as Training Area P-1 is at highest risk.

Unit A - Dillingham Airstrip

Ignition	-	Low	Some military activity, no live-fire
Hazard	-	Low	Heavily managed fuels, excellent access, many roads
Value	-	Low	No federally listed species

Unit B - P-1

Ignition	-	High	Higher level of military activity, pyrotechnics authorized
Hazard	-	High	Heavy grass and shrub fuels
Value	-	Moderate	Several federally listed birds, which use the site occasionally but have not been noted in 15 to 20 years

Unit C - P-2 and P-3

Ignition	-	High	Significant military training, pyrotechnics authorized (once the second firebreak is completed)
Hazard	-	High	Heavy grass and shrub fuels, little to no access
Value	-	Low	No federally listed species

Unit D - Cantonment
- Ignition - Low — Significant military activity, but no training and therefore few ignition sources
- Hazard - Low — Heavily managed fuels, many roads
- Value - Low — No federally listed species

Unit E - Outside Firebreak
- Ignition - Low — Some military training, but no ignition sources allowed
- Hazard - High — Heavy flammable fuels
- Value - Moderate — One federally listed species

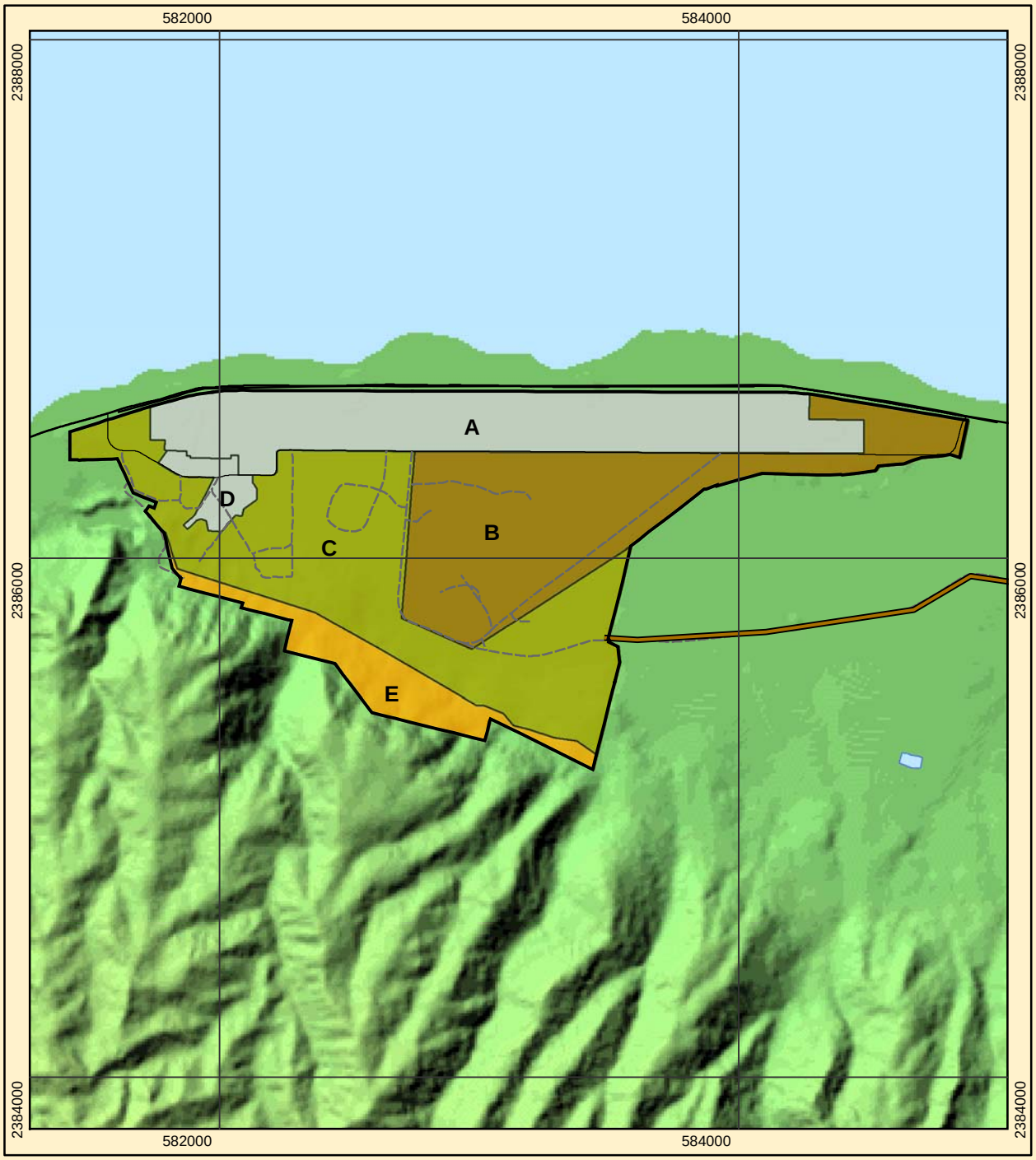
(2) By assigning values of 0, 1, and 2 to the low, moderate, and high designations respectively, and adding the values for ignition potential, hazard, and value, a priority level for each area has been determined:

Table 7.2.2
DMR Pre-Suppression Priority

Map Label	*Location*	*Pre-Suppression Priority*
Unit B	P-1	5
Unit C	P-2 and P-3	4
Unit E	Outside Firebreak	3
Unit D	Cantonment	2
Unit A	Dillingham Airstrip	0

Dillingham Military Reservation
Pre-Suppression Priority

Figure 3



N

1:24,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003

Legend

Pre-Suppression Priority
- None
- Low
- Moderate
- High
- Very High

Installation Boundary

Surface Water Body

Roads
- Primary
- Secondary
- Unimproved
- Military Vehicle Trail

7.2.5. Fire Protection.

a. Firebreak System.

(1) There are no existing firebreaks at DMR, though there are a number of existing roads that will serve as firebreaks during fire suppression, and two firebreaks are planned for the near future. Standards for firebreaks are listed in Section 4.3.

(2) Two firebreaks are scheduled for construction at DMR (Figure 4).

a. The first to be constructed will be completed in 2005. It will follow existing roads, though some will have to be improved considerably. The firebreak will start on the east side of DMR, continue across the southernmost taxiway, continue west for approximately 1/2 km, and then turn north and continue to the Dillingham airstrip.

b. The second firebreak will be constructed in 2006. It will separate the majority of DMR from the hills to the south. This break will start in the same location on the east side of the installation but will first run south along the eastern installation border. It will turn to the west at the base of the mountains and follow contours until it meets an existing powerline corridor. It will follow this corridor to the western boundary where it will turn north until it meets the Dillingham airstrip.

c. Training will be allowed outside of the firebreaks, but will be limited to no ignition sources of any kind. Pyrotechnics, blanks, smoking, and cooking/warming fires are not allowed anywhere outside of the second firebreak at any time. Until the second firebreak is completed, this restriction will apply to the first firebreak. Until the first firebreak is completed, this restriction will apply to any area outside of P-1 and the Dillingham airstrip.

b. Fuels Modification. Several fuels management projects will be considered at DMR.

(1) Fuels along the Dillingham Military Vehicle Trail will be kept at less than 20% crown cover as ocularly estimated. Because there is little vegetation along the trail due to extensive agriculture, maintenance of this corridor should be minimal.

a. The trail will be monitored once annually in the spring to determine the need for fuels management. Any area with fine fuels and/or shrub cover greater than 20% crown cover will be noted and managed.

b. Locations that are overgrown will be managed either through the application of herbicide or by cutting the grass or shrubs until they are in compliance.

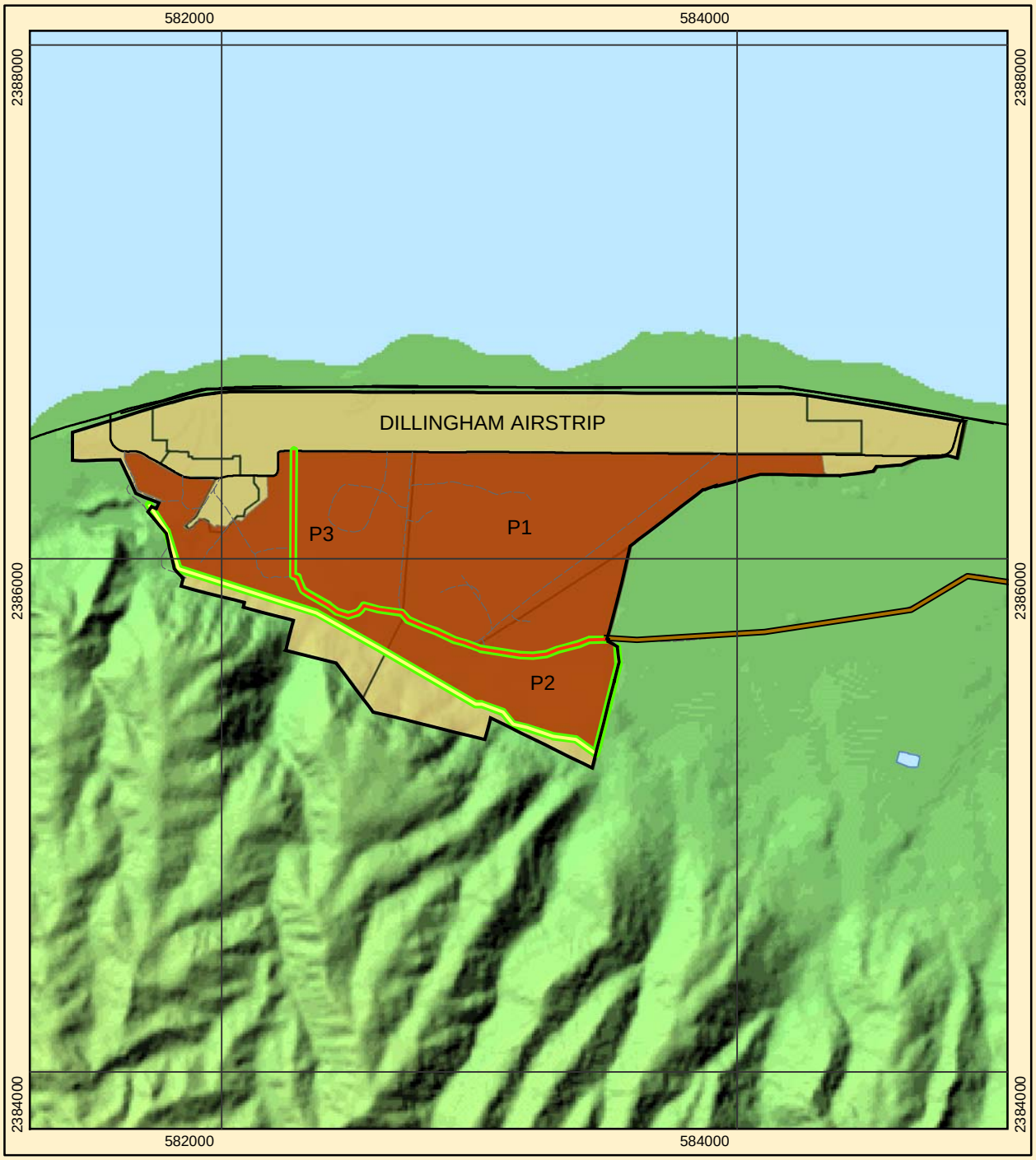
(2) Fuels contained by the finished firebreaks at DMR may be considered for prescribed burning. This will be dependent on financial and resource availability and the discretion of the Wildland Fire Program Manager.

a. Any prescribed burning that is planned will follow all guidelines in place in Section 4.4 and will require proper environmental documentation and consultation with the USFWS.

b. No prescribed burning will take place outside of completed firebreaks.

Dillingham Military Reservation
Firebreaks and Fuels Management

Figure 4



1:24,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003
USARHAW IFSO

Legend

- Proposed Firebreak 1
- Proposed Firebreak 2
- Potential Prescribed Burning
- Herbicides
- Installation Boundary
- Training Areas
- Surface Water Body

Roads

- Primary
- Secondary
- Unimproved
- Military Vehicle Trail

7.2.6 Project Budget FY 03 to 05*

PROJ/FEWR NO.	PROJECT TITLE	EST COST (x $1000)	FUNDED BY	FY
TA100243J	Install New DMR RAWS Unit	**18**	DPW ENV	O4
TA100253J	Rpr/Maint & Extend Interior Firebreak Road	**125**	DPW/TCCC	O5
TA100263J	Construct New DMR Firebreak	**190**	DPW ENV	O6
	Total	**333**		

*See Annex I for the sustainment budget

Table 7.2.3
Federally Listed Endangered and Threatened Species
at Dillingham Military Reservation*

Status	Hawaiian / Common Name	Scientific Name
PLANTS:	**None**	
ANIMALS:	**None**	

*According to Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.

7.3. KAWAILOA TRAINING AREA (KLOA)

7.3.1. General Description.

a. Location and Size. KLOA consists of 9449 hectares (23,348 acres) of land on central Oahu on the slopes of the Ko'olau Mountain range, directly south of the bordering KTA. All 9449 hectares are leased from Dole Foods Co., Inc. (7532), Attractions Hawaii (140) and the State of Hawaii (1777).

b. Military Land Use. KLOA is situated in some of the most rugged terrain in Hawaii. Very deep ravines, dense vegetation, and tropical rain forest characterize the installation. Access is very limited, although there is an unimproved roadway along the western boundary of the area that traverses a small relatively flat and clear area. Only 2149 hectares (5,310 acres) of the training area are actually suitable for maneuver training activities. The remaining 7230 hectares (18,038 acres) are considered unsuitable due to slopes in excess of 20 percent. The area is considered excellent for mountain and jungle warfare training because of its ravines and dense vegetation. In areas with a slope of 20 percent or more, troop deployment is typically limited to single file, small unit movements on ridgelines. KLOA is used primarily for small infantry unit maneuver and helicopter training. Nap of the earth (NOE) and night vision goggle (NVG) helicopter training is common. Small unit infantry maneuver operations via helicopter insertion are also practiced.

c. Training Capabilities. The lease agreement with Dole Foods Co., Inc. and State of Hawaii prohibits live-fire, tracer ammunition, incendiaries, explosives, and pyrotechnics in all parts of KLOA. Blank fire of small arms up to .50 caliber is allowed. Attractions Hawaii leases prohibit weapons firing in some training areas.

d. Climate.

(1) Rainfall. Rainfall at KLOA is variable based upon elevation. Upper portions of the installation receive an average of 635cm (250 inches), while in the lower portions along the central plateau the annual average rainfall is 127cm (50 inches).

(2) Temperature. Temperatures at KLOA range from 15.5 to 32.2° C (60° to 90° F) and average 22°C (71° F), with average high temperatures of 26.5° C (80° F).

(3) Relative Humidity. Average relative humidity as measured by the SBER RAWS is 82%, with an average maximum and average minimum of 95% and 59% respectively.

(4) Wind. Winds are dominated by trades out of the northeast. Average windspeed as measured by the SBER RAWS is 4.7 mph, with average max windspeed at 8.2 mph.

e. Topography. Elevation in the training area varies from approximately 1,052m (2,600 ft) above sea level at the crest of the Ko'olau Mountain Range, to approximately 405m (1,000 ft) in the lower western portion. The topography is often extreme, with steep sided and deep valleys partitioning the training area at regular intervals.

7.3.2. Vegetation Fuels Classification.

All eight classes of Oahu fuels are found at KLOA (Figure 5 and Table 7.3.1). These classes were derived from the National Forest Fire Laboratory (NFFL) fuel behavior models as defined by Anderson (1982). For a full description of Oahu fuel types and their derivation see Section 3.5.

Table 7.3.1
Fuel Types at KLOA

Fuel Type	*Fuel Model*	*Vegetation Classifications Included (Genus only)*
Short Alien Grassland	NFFL 2	*Andropogon*
Tall Alien Grassland	Guinea Grass Custom	*Leucaena/Panicum, Melinis/Panicum, Panicum*
Eucalyptus Forest	NFFL 10	*Eucalyptus, Melaleuca*
Ironwood Forest	NFFL 9	*Casuarina*
Mixed Forest	NFFL 8	*Metrosideros/Acacia koa/Dicranopteris*
Christmas Berry Shrublands	NFFL 5	*Schinus*
Kukui Forest	Kukui Custom	*Aleurites*
Developed/Denuded	None	*Agriculture, Urban Development, Bog, Open Water, Roads*

7.3.3. Fire History for KLOA.

Only one fire has been recorded at KLOA. It burned 125 hectares (310 acres) in September of 2000. The reported ignition source was hot brass/muzzle flash, and must have been caused by blank fire, since no other munitions are allowed at KLOA. Despite the size of this fire, blanks represent a very low fire ignition threat based on the number of fires they have caused throughout the USARHAW fire history. No analysis for fire trends is possible at KLOA with such a limited data set.

7.3.4. Resource Protection.

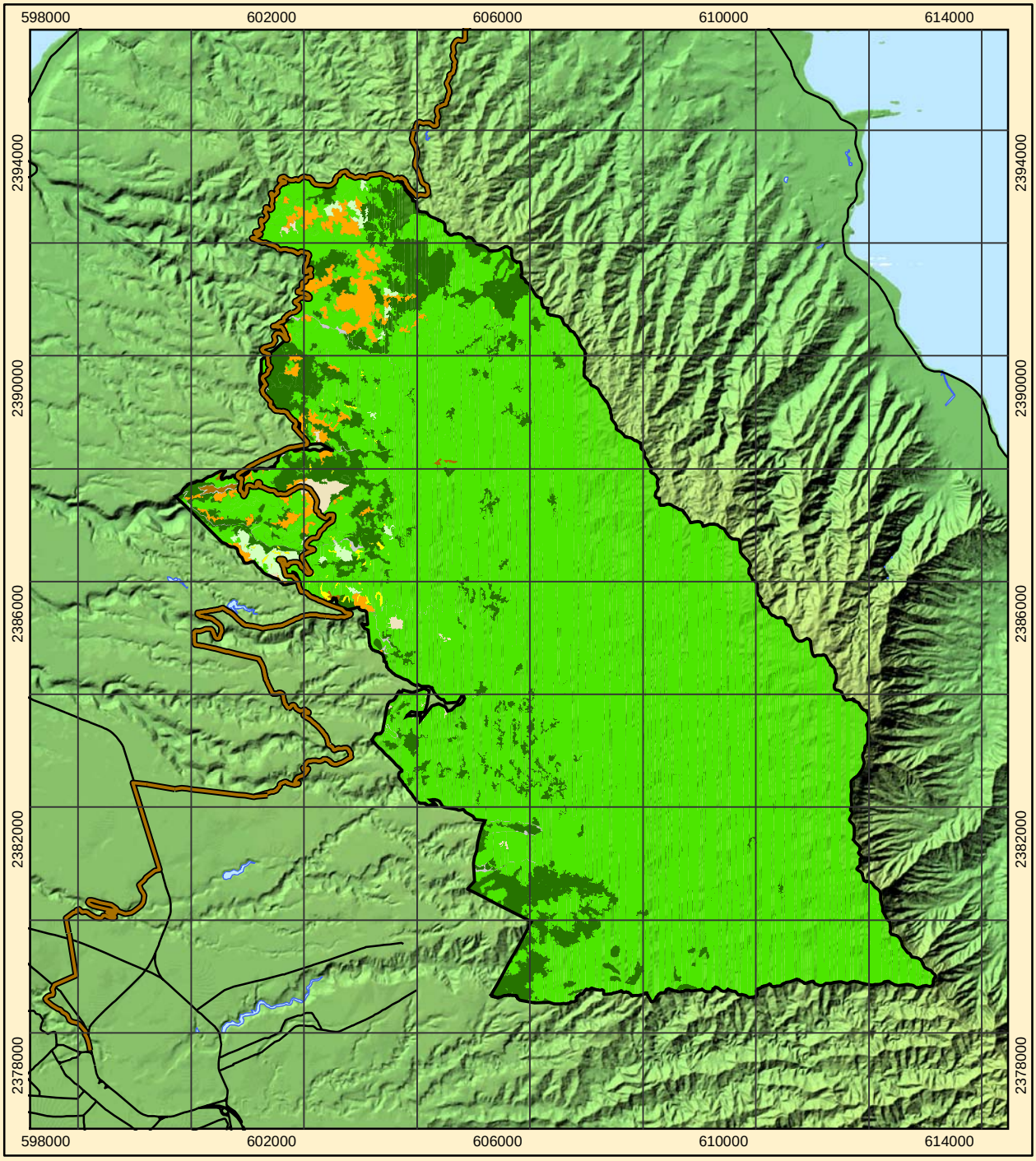
a. Biological Sensitive Areas (BSA).

(1) The vegetation at KLOA varies according to the surrounding topography. Mixed open forests characterize the higher elevations. Below 607m (1,500 ft) above sea level, open guava forests with shrubs and Bermuda grass characterize the vegetation. Ten native natural community types have been identified, two of which are considered rare.

(2) Portions of KLOA have been designated BSA-1 and –2 areas. There are several BSA-1 areas and one larger BSA-2 area in KLOA.

Kawailoa Training Area
Fuels

Figure 5



1:110,000

0 2,500 5,000 Meters

0 1 2 Miles

Data Source: Center for Environmental Management of Military Lands 2003
IKONOS 4 meter Multispectral Imagery

Legend

Fuels
- Christmas Berry Shrublands
- Developed/Denuded
- Eucalyptus Forest
- Ironwood Forest
- Kukui Forest
- Mixed Forest
- Short Alien Grassland
- Tall Alien Grassland

- Installation Boundary
- Surface Water Body
- Primary Roads
- Military Vehicle Trail

b. Protected Species.

(1) KLOA has large contiguous tracts of native forest. According to a Biological Assessment from March of 2003, there are 17 federally listed plant taxa at KLOA. There are also 5 listed invertebrates.

(2) Table 7.3.2 lists the federally listed species identified at KLOA.

c. Cultural Resources.

(1) Cultural resources identified at KLOA (79 known sites) include a complex of agricultural sites, a habitation complex, and an enclosure. The majority of these sites are located along the numerous stream channels. In Anahulu Valley (Kawailoa Uka) there are rock shelters used in pre-European contact times dating to 1280 A.D.; burial caves; a pond field; irrigation sites; habitation terraces dating from the 1600s; walls; and enclosures. Minor agricultural features such as stone mounds, alignments and simple terraces are also evident.

(2) Areas with high probability of archaeological sites include stream valleys. One such area along Anahulu Stream was identified in a 1992 survey. The remainder of KLOA is in the moderate probability category for archaeological resources, including steep slopes that could contain rock shelters and burial caves.

(3) Seven of the 40 archaeological sites reported by Kirch (1992) in Kawailoa Uka in 1982 are located within the KLOA, just inside the area's western boundary. Many of these sites correspond to landholdings and Land Commission Awards in Kawailoa-uka. These sites include three habitation terraces, three pond field irrigation systems, and a series of earthen terraces. Three additional sites are located just outside the project area to the west.

(4) All sites identified in the KLOA would be considered significant under Criterion D as resources that "have yielded, or may be likely to yield, information important in prehistory or history." In addition, burial caves and burial platforms identified in the training area would be considered significant due to their cultural importance to native Hawaiians.

d. Wildfire Prevention Analysis

(1) A wildfire prevention analysis requires that a parcel of land be divided by significant barriers to fire, either manmade or natural, in order to create units that are then given a pre-suppression priority. Because there are no readily definable barriers within KLOA, it is not possible to carry out a wildfire prevention analysis.

(2) Generally speaking, however, areas at low elevation are dominated by flammable alien species, while higher elevations are less fire prone. Conversely, low elevations harbor few federally listed species, while high elevations contain many. For these reasons, pre-suppression dollars would be best spent in low elevation areas concentrated around heavily used training locations.

7.3.5. Fire Protection.

a. A new RAWS will be purchased and placed at Puu Kapu in fiscal year 2004 to facilitate fire danger rating at KLOA.

b. Firebreak System.

(1) There are no existing firebreaks at KLOA, though Drum road that can serve as a control line during fire suppression (Figure 6). It will not be kept at firebreak standards and will be maintained only for vehicle access.

(2) There are no plans for any firebreaks to be built in KLOA.

(3) Several other roads throughout the installation will serve to provide access for fire fighting vehicles.

c. Fuels Modification.

(1) Fuel modifications by mechanical crushing, chemical herbicide, and prescribed burning techniques (where applicable) shall be utilized whenever possible and necessary. Where it is not possible to crush and/or prescribed burn, selective clearing and removal with hand labor will be considered.

(2) There are no plans for any fuels management at KLOA at this time. The sole exception to this is for the Kawailoa to Schofield Barracks Military Vehicle Trail. Should this trail be built, unmanaged fuels will be cut and/or herbicided wherever they occur. Fine fuels will be kept to less than 1 foot in height and/or less than 20% crown cover. Determination of the state of the fuels will occur once annually and will be via calibrated ocular estimation. It is unlikely that much if any fuels management will be required along this route as the majority passes through heavily managed agricultural fields.

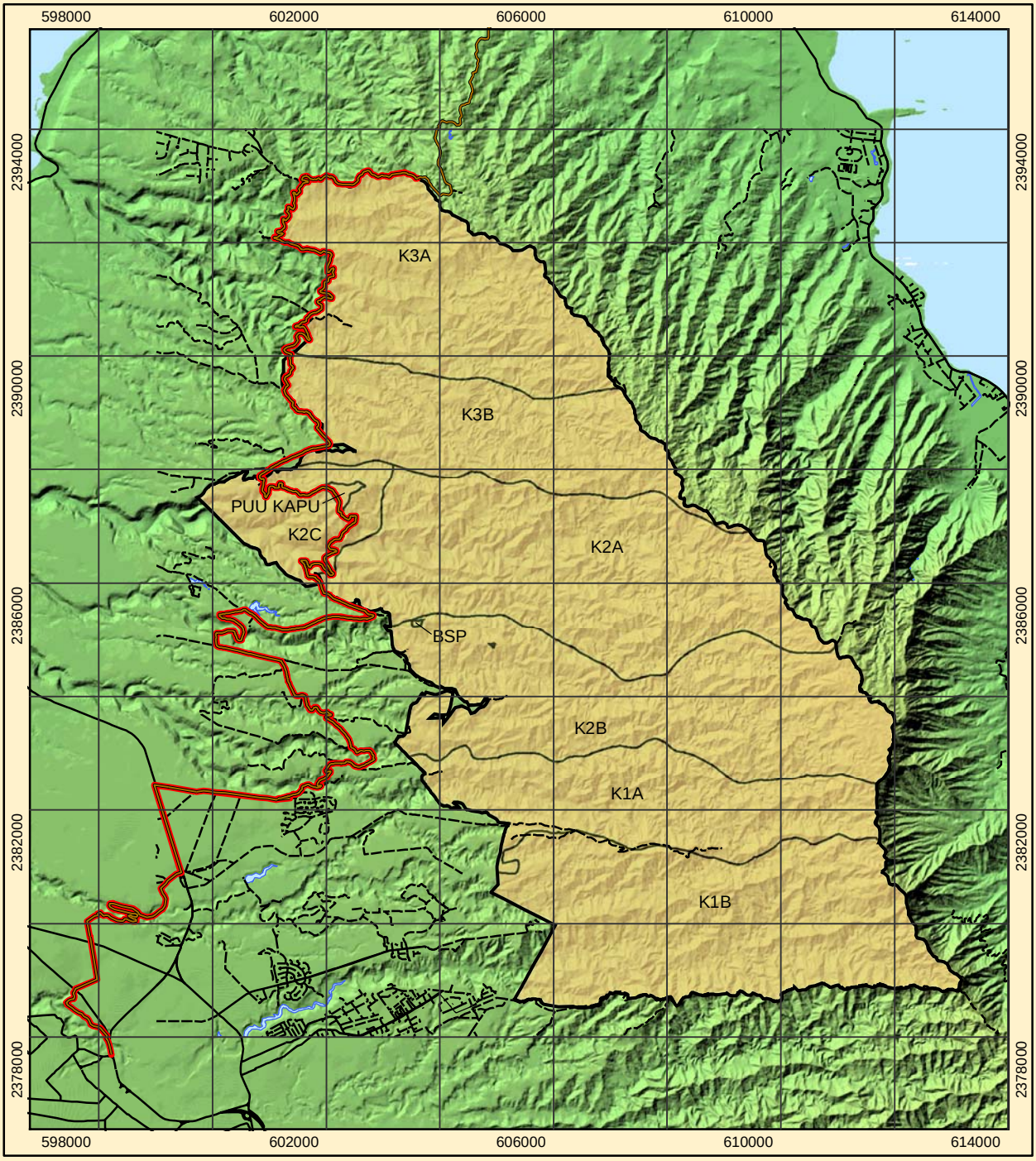
7.3.6 Project Budget FY 03 to 05*

PROJ/FEWR NO.	PROJECT TITLE	EST COST (x $1000)	FUNDED BY	FY
TA100223J	Install New KLOA RAWS Unit (Pu'u Kapu)	**18**	DPW ENV	O4
TA100233J	Fuel Modification/Vegetation Control KLOA	**30**	DPW ENV	O4
	Total	**48**		

*See Annex I for the sustainment budget

Kawailoa Training Area
Firebreaks and Fuels Management

Figure 6



N

1:110,227

0 2,500 5,000 Meters

0 1 2 Miles

Data Source: Center for Environmental Management of Military Lands 2003
USARHAW IFSO

Legend

- Proposed Fuels Management Area
- Installation Boundary
- Training Areas
- Surface Water Body

Roads

- Primary
- Secondary
- Tertiary
- Military Vehicle Trail

Table 7.3.2
Federally Listed Endangered and Threatened Species
At Kawailoa Training Area*

Status	Hawaiian / Common Name	Scientific Name
PLANTS:		
Endangered	‘Akoko, koko, kokomalei	*Chamaesyce rockii*
Endangered	‘Oha, haha, ‘ohawai	*Cyanea acuminata*
Endangered	‘Oha, haha, ‘ohawai	*Cyanea crispa*
Endangered	haha, ‘ohawai	*Cyanea humboldtiana*
Endangered	haha, ‘ohawai	*Cyanea koolauensis*
Endangered	haha, ‘ohawai	*Cyanea st. johnii*
Endangered	None	*Cyrtandra dentata*
Endangered	None	*Cyrtandra viridiflora*
Endangered	Nanu, na’u	*Gardenia mannii*
Endangered	None	*Hesperomannia arborescens*
Endangered	Alani	*Melicope lydgatei*
Endangered	Wawai’iole	*Phlegmariarus nutans*
Endangered	None	*Phyllostegia hirsuta*
Endangered	None	*Pteris lidgatei*
Endangered	None	*Sanicula purpurea*
Endangered	Ohe’ohe	*Tetraplasandra gymnocarpa*
Endangered	None	*Viola oahuensis*
ANIMALS:		
Endangered	Pupu kanioe, pupu kuahiwi, kahuli	*Achatinella apexfulva*
Endangered	Pupu kanioe, pupu kuahiwi, kahuli	*Achatinella byronii*
Endangered	Pupu kanioe, pupu kuahiwi, kahuli	*Achatinella lila*
Endangered	Pupu kanioe, pupu kuahiwi, kahuli	*Achatinella livida*
Endangered	Pupu kanioe, pupu kuahiwi, kahuli	*Achatinella sowerbyana*

*According to Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.

7.4. KAHUKU TRAINING AREA (KTA)

7.4.1. General Description.

a. Location and Size. The Kahuku Training Area (KTA) is situated on the slopes of the northern end of the Koolau Mountain Range, approximately 18 road miles from Schofield Barracks. The area consists of 3806 hectares (9,406 acres) of which 10 hectares (25 acres) are owned in fee. Seven hectares (18 acres) are Easement/License/Permit and the Army leases 3789 hectares (9,363 acres) from the State of Hawaii (465) and Campbell Estates (3320).

b. Military Land Use. KTA is the largest contiguous ground-maneuver training area on Oahu. The southern (uphill) portion lies adjacent to the Kawailoa Training Area and is characterized by the same rugged, densely vegetated terrain. Only the northern region contains an area suitable for maneuver. This portion contains rolling grass and brush covered terrain. The entire area is compartmentalized by several gullies that are oriented south to north.

c. Training Capabilities.

(1) The Campbell Estate lease agreement prohibits live-fire and tracer ammunition. Blank ammunition and limited pyrotechnics are permitted. Aerial pyrotechnics are not allowed anywhere in KTA. The State lease allows small arms up to .50 caliber and no tracer or incendiary ammunition. Three point five inch rockets or similar size weapons may be used with inert rounds. Although live-fire is authorized on State land, live-fire operations have not been conducted in the Kahukus since the lease was signed in 1964. Implementation of SBCT will include live-fire training at KTA that will be limited to short range training ammunition.

(2) KTA is capable of accommodating varying scenarios supporting infantry battalion ARTEP missions. Much of the terrain is rugged and ill suited for large-scale field exercises. However, the area is excellent for mountain and jungle warfare training. It is also used for air support training with both fixed and rotary wing aircraft.

d. Climate. The climate of the northern Koolau Loa District is drier and windier than the southern portion. The northern portion receives less rainfall that other windward areas of the island. This condition is primarily due to the lower mountains that do not trap as much of the moisture-rich northeastern trade winds. The trade winds pass over the area, dropping less moisture on the windward slopes than the higher mountains to the south.

(1) Rainfall. Average annual rainfall with KTA varies from 102cm (40 inches) on the coastal plain to about 381cm (150 inches) at the crest of the Koolau Range. Data from the meteorological station, located at 10m (25 ft) above sea level, indicate the coastal plain receives between 102 and 127cm (40 and 50 inches) annually, with the majority of precipitation occurring between November and March (wet season) and the least between June and September (dry season).

(2) Temperature. Temperatures vary with recorded monthly lows between 9° C (48º F) (night) to 32.7° C (91º F) (day) in January and recorded monthly highs between 12.8° C (55º F) (night) and 35° C (95º F) (day) in October.

(3) Relative Humidity. Average relative humidity data was gathered from the KTA RAWS station located near the Range Control building for the period June 2000 to June 2002. Average RH for this period was 70%.

(4) Wind.

(a) Surface winds are predominately northeastern trade winds. The trades are generally more persistent in summer than winter, and are often stronger in the afternoon than in the morning or at night. Between October and April, the winds may shift and become southern, southwestern, or northwestern winds that precede cold fronts. More turbulent winds can be expected anywhere there are topographical high points.

(b) The windiness of the coastal zone and unprotected upland slopes is considered to be above average. Wind in the area averages between 18-20 knots airspeed, making the area one of the windiest on Oahu.

e. Topography. KTA ranges in elevation from near sea level along the inland portion of the coastal plain to 753m (1,860 ft) in the uplands along the crest of the Koolau range. It is composed of a narrow coastal flat adjacent to upraised limestone cliffs and relatively short, narrow valleys that quickly become rugged and steep a short distance inland. Topography within KTA varies from nearly level coastal plains to nearly vertical bluffs along the Kahuku escarpment and within steeper portions of the many stream drainage basins. The upland areas consist of dissected stream drainage basins and moderate slope lands, with slopes ranging from 3 to 25 percent or more.

7.4.2. Vegetation Fuels Classification.

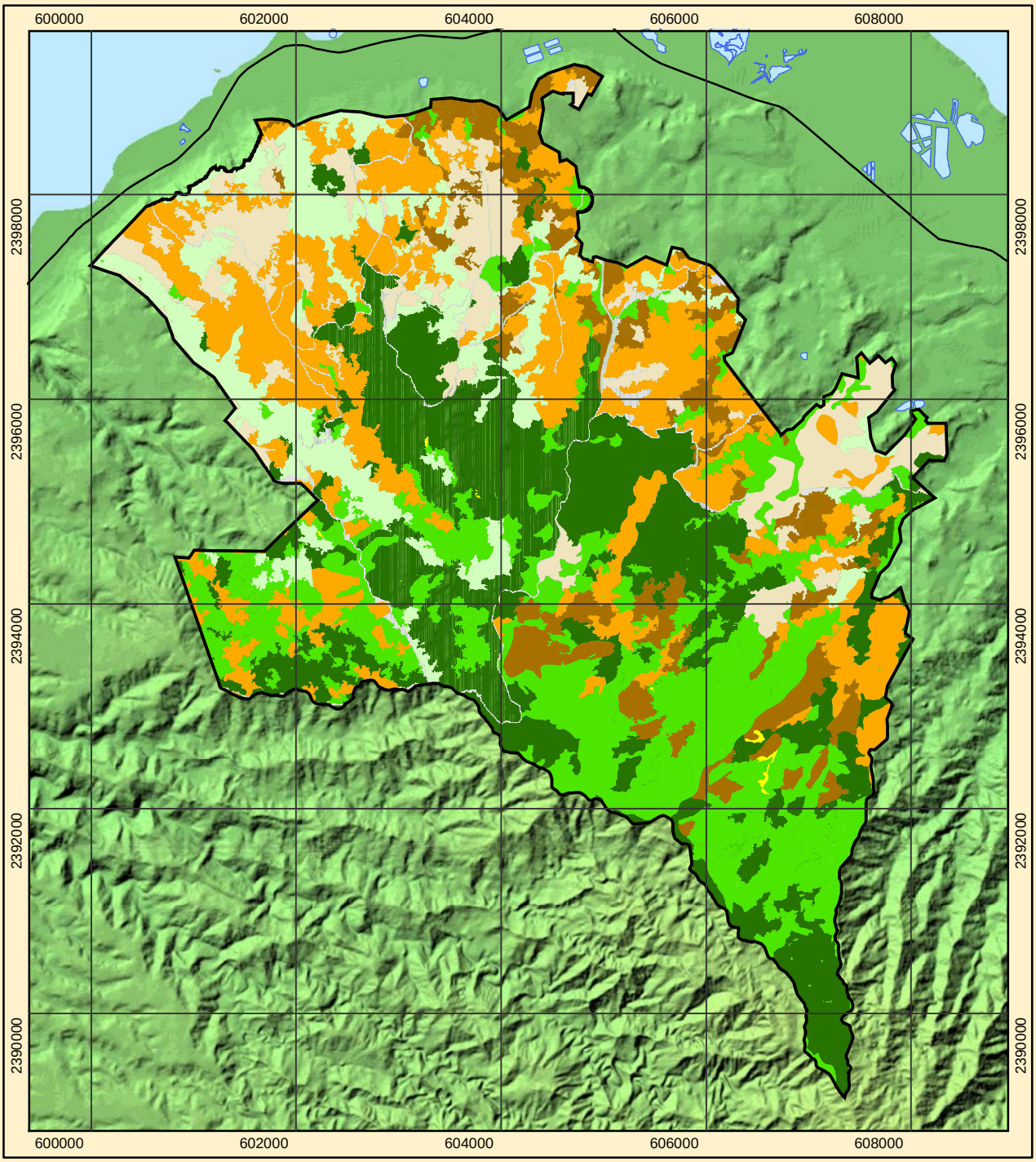
The wildland fire fuel types found at KTA have been categorized into eight classes (Figure 7 and Table 7.4.1). These classes were derived from the National Forest Fire Laboratory (NFFL) fuel behavior models as defined by Anderson (1982). For a full description of Oahu fuel types and their derivation see Section 3.5.

Table 7.4.1
Fuel Types at KTA

Fuel Type	*Fuel Model*	*Vegetation Classifications Included (Genus only)*
Short Alien Grassland	NFFL 2	*Andropogon*
Tall Alien Grassland	Guinea Grass Custom	*Leucaena/Panicum, Melinis/Panicum, Panicum*
Eucalyptus Forest	NFFL 10	*Eucalyptus, Melaleuca*
Ironwood Forest	NFFL 9	*Casuarina*
Mixed Forest	NFFL 8	*Metrosideros/Acacia koa/Dicranopteris*
Christmas Berry Shrublands	NFFL 5	*Schinus*
Kukui Forest	Kukui Custom	*Aleurites*
Developed/Denuded	None	*Agriculture, Urban Development, Bog, Open Water, Roads*

Kahuku Training Area
Fuels

Figure 7



1:60,000

0 500 1,000 Meters

0 0.5 1 Mile

Fuels
- Christmas Berry Shrublands
- Developed/Denuded
- Eucalyptus Forest
- Ironwood Forest
- Kukui Forest
- Mixed Forest
- Short Alien Grassland
- Tall Alien Grassland

Legend
- Installation Boundary
- Surface Water Body
- Roads

Data Source: Center for Environmental Management of Military Lands 2003
IKONOS 4 meter Multispectral Imagery

7.4.3. Fire History for KTA.

Records indicate that there have been 16 fires at KTA since 1996. These fires burned less than 121 hectares (300 acres) total. A Single fire of 101 hectares (250 acres) in the late 90's in training area C-2 accounted for 85% of the recorded acreage burned. About half of the fires started in August, but there is no clear pattern in the time of ignition. A number of different pyrotechnic devices, including smoke grenades, simulators, and star clusters, as well as blanks were the ignition sources.

7.4.4 Resource Protection.

a. Biological Sensitive Areas (BSA).

(1) Seven (7) native natural communities have been identified at KTA, none of which are considered rare (See Figure 8). Vegetation in the area is mixed and includes species typical of dry lowland and wet upland areas. Post-European contact land alterations, including sandalwood trade, ranching, and pineapple and sugarcane cultivation, have resulted in much of the area being dominated by introduced species such as various range grasses and guava. Pineapple and sugarcane are still grown in coastal areas bordering KTA. Upland sections of KTA within the forest reserves still contain native vegetation, including 'o'hia and hapu'u tree ferns. Valleys and gulches are dominated by introduced species, although some native vegetation is still present in these areas.

(2) Much of the uplands of KTA have been designated as BSAs, though the majority of the area covered by this designation falls into the BSA-3 category. There are five areas designated as BSA-2, mostly in the uplands of the training area. There are no BSA-1 areas within KTA.

b. Protected Species.

(1) Four endangered plant taxa that have been identified at KTA (Table 7.4.3).

(2) The USFWS has identified several threatened and endangered species that are known to inhabit the area in and around KTA . Table 7.4.2 lists the species identified at KTA and listed by USFWS

c. Cultural Resources.

(1) Forty-three cultural sites have been identified within KTA. Areas of KTA with a high probability for archaeological resources are closest to the coast, and could contain permanent habitation deposits and religious sites. Areas with moderate probability of containing irrigated or dry land agricultural sites are along stream-eroded gulches and in the lower cultivable flatlands. These areas are seldom used for maneuver training events.

(3) Some of the archeological sites identified in KTA would be considered significant under Criterion D of the NHPA as resources that "have yielded, or may likely to yield, information important in prehistory or history." In addition, religious sites identified in KTA could also be considered significant due to their cultural importance to native Hawaiians.

d. Wildfire Prevention Analysis

(1) Two wildfire areas have been designated based on the location of the most commonly used training areas, and existing roads. Each area was assigned an ignition potential, hazard, and value based upon the best currently available information (see Section 4.2.6 for further information on wildfire prevention analyses). The resulting Pre-Suppression Priority map (Fig. KTA-3) shows that the western half of KTA is at highest risk.

Unit A -

Ignition	-	High	Significant military activity, pyrotechnics authorized, no live-fire
Hazard	-	High	Areas of heavy, flammable fuels, little or no compartmentalization
Value	-	High	Many federally listed species

Unit B -

Ignition	-	High	Significant military activity, pyrotechnics authorized, no live-fire
Hazard	-	High	Areas of heavy, flammable fuels, little or no compartmentalization
Value	-	Low	No federally listed species

Unit C -

Ignition	-	High	Significant military activity, pyrotechnics authorized, no live-fire
Hazard	-	High	Areas of heavy, flammable fuels, little or no compartmentalization
Value	-	Low	No federally listed species

Unit D -

Ignition	-	Moderate	Some military activity, but less than areas B1, B2, and C2
Hazard	-	Moderate	Alien species predominate, but no large grassy areas
Value	-	Low	No federally listed species

Unit E -

Ignition	-	High	Increased activity with SBCT
Hazard	-	Moderate	Small grassy areas, higher moisture than areas A through C
Value	-	Low	No federally listed species

Unit F -

Ignition	-	Moderate	Some military activity, but reduced from high traffic areas
Hazard	-	Moderate	Alien species predominate, but no large grassy areas
Value	-	Low	No federally listed species

Unit G -

Ignition	-	Low	Very little military training
Hazard	-	Low	High moisture regime, vegetation not conducive to fire
Value	-	Low	No federally listed species

Unit H -

Ignition	-	Low	Very little military training, no vehicles, little foot traffic
Hazard	-	Low	Very high moisture regime, vegetation is wet and generally will not carry fire
Value	-	High	Many federally listed species

(2) By assigning values of 0, 1, and 2 to the low, moderate, and high designations respectively, and adding the values for ignition potential, hazard, and value, a priority level for each area has been determined:

Table 7.4.2
KTA Pre-Suppression Priority

Map Label	*Training Areas Included**	*Pre-Suppression Priority*
Unit A	A1, A2, A3, B1, B2, C2	6
Unit B	A1, B1	4
Unit C	B1, B2, C2	4
Unit E	C1	3
Unit D	C1	2
Unit F	C1, D1	2
Unit H	C1, D1, D2	2
Unit G	D1	0

*Pre-suppression priority areas may cover all or only a portion of training areas.

7.4.5. Fire Protection.

a. Firebreak System. There are no existing firebreaks at KTA, though there are a number of existing roads that will serve as fire control lines during fire suppression. These roads will not be kept at firebreak standards and will only be maintained to the extent necessary for vehicle traffic. Standards/requirements applying to both firebreaks and fuelbreaks are established in Section 4.3 of this IWFMP:

b. Fuels Modification. Fuel modifications by mechanical crushing, chemical herbicide, and prescribed burning techniques (where applicable) shall be utilized whenever possible and necessary. Where it is not possible to crush and/or prescribed burn, selective clearing and removal with hand labor will be considered. There are no plans for fuels modifications at KTA.

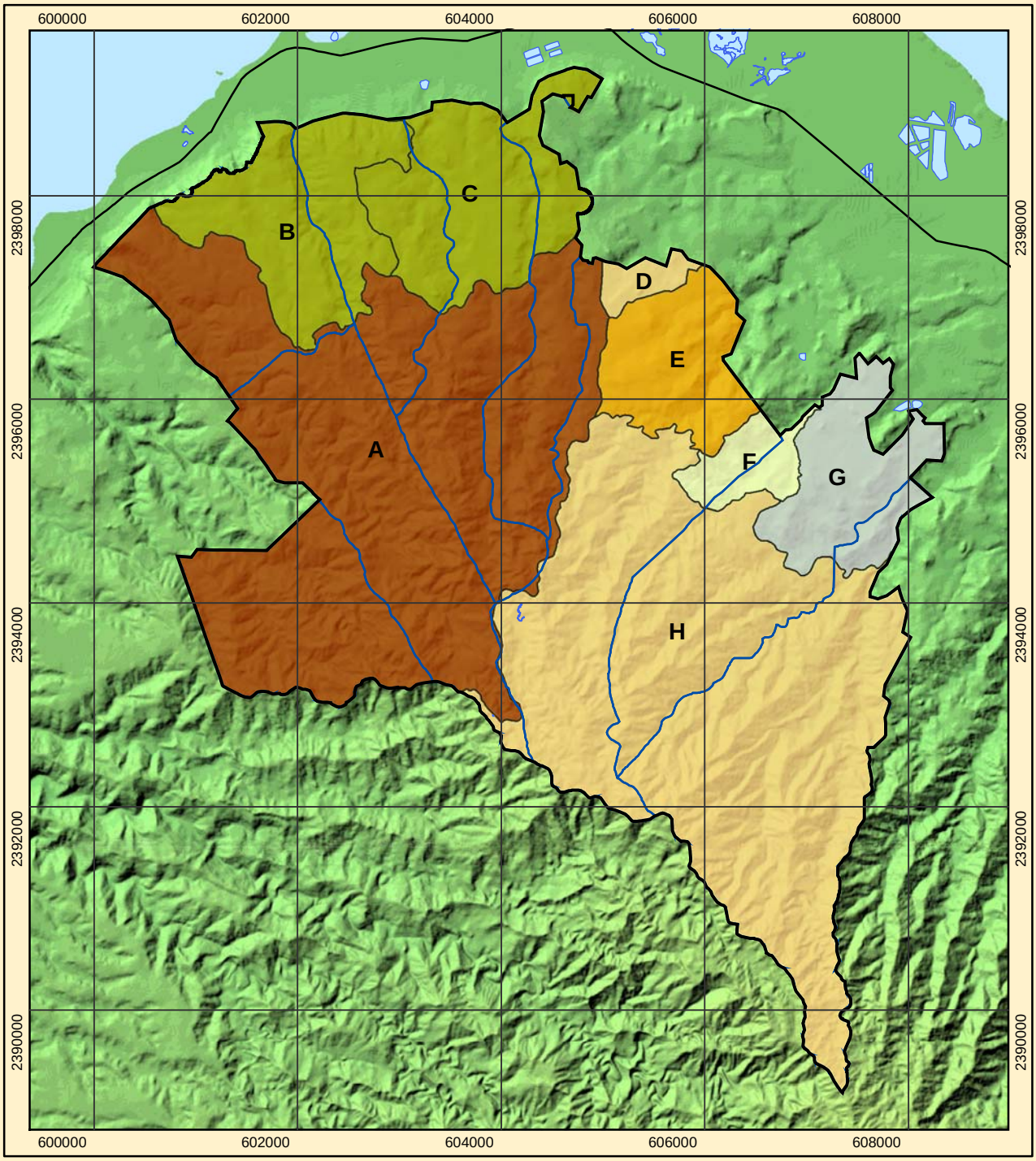
7.4.6 Project Budget FY 03 to 05*

PROJ/FEWR NO.	PROJECT TITLE	EST COST (x $1000)	FUNDED BY	FY
TA100183J	Construct New KTA Dip Pond	**70**	DPW TCCC	O5
TA100203J	Procure 2 New Fire Vehicles for KTA	**150**	IFSO	O4
TA100213J	Fire Access Road Maintenance KTA	**25**	DPW TCCC	O4
	Total	**263**		

*See Annex I for the sustainment budget

Kahuku Training Area
Pre-Suppression Priority

Figure 8



N

1:60,239

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003

Legend

Pre-Suppression Priority

- None
- Low
- Moderate
- High
- Very High

- Installation Boundary
- Training Areas
- Surface Water Body
- Primary Roads

Table 7.4.3
Federally Listed Endangered and Threatened Species
At Kahuku Training Area*

Status	Hawaiian / Common Name	Scientific Name
PLANTS:		
Endangered	haha, ‘ohawai	Cyanea koolauensis
Endangered	Nioi	Eugenia koolauensis
Endangered	Nanu, na’u	Gardenia mannii
Endangered	`Ohe`ohe	Tetraplasandra gymnocarpa
ANIMALS:	**None**	

*According to Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.

7.5. MAKUA MILITARY RESERVATION (MMR)

7.5.1. General Description.

a. Location and Size. MMR is located on the northwest side of the island, near Kaena Point. The training area extends west from the Waianae Range ridgeline to the ocean. It is approximately three miles north of Makaha, which is the nearest town. The area consists of 1696 hectares (4,190 acres) of which 69 (170 acres) are owned in fee, 1346 (3,326 acres) are ceded, one (2 acres) is Easement/License/Permit, and 316 (782 acres) are leased from the State of Hawaii. MMR is the home of the Pilila'au Range Complex, the single range facility on MMR.

b. Military Land Use. The MMR Pilila'au Range Complex is the largest training area on the Island of Oahu that will support both maneuver and live-fire training, including limited helicopter live-fire training and explosive ordnance operations. The Pilila'au Range Complex is the primary Company Combined Arms Assault Course (CCAAC) for Oahu. The range is used for combined arms live-fire exercises at the infantry company level. The impact area is used for live-fire exercises and potentially contains unexploded ordnance.

c. Training Capabilities. The Pilila'au Range Complex will support small unit training from squad/team to infantry company plus levels. All small weapon systems integral to the 25th ID(L) can be utilized in the impact area except for tracers, aerial pyrotechnics, 155mm artillery, Tube Launched Optical Weapon System (TOW), and 2.75" rockets.

d. Climate.

(1) MMR is shadowed by two mountain ranges that greatly influence its local climate. The apex at the east end of MMR ties into the Waianae Range, which is climatically downwind from the Koolau Range to the east. The Waianae Mountains peak higher than the Koolau Mountains, but the trade winds yield more precipitation to the Koolaus. The variability of the local climate influences the vegetation distribution and fire environment.

(2) The principal fire climate variables are rainfall, temperature, relative humidity, and wind speed. The following summary is distilled from a weather station located at the west end of MMR, except for the description of rainfall, which was obtained from The Atlas of Hawaii (Giambelluca and Schroeder 1998). A more complete description of the climate variability at MMR can only follow from empirical studies with more strategically placed weather stations, or high resolution weather models.

a. Rainfall. Mean annual rainfall on the island of Oahu varies from a high exceeding 6350 mm (250 in) in the Koolau Range on the eastern end, to less than 500 mm (20 in) on the leeward coast, south of Makua. The northeast trade winds are predominant over most of the islands, except where the landform provides a sheltering effect. As the moisture-laden trade winds approach Oahu from the northeast, they cross the Koolau Range almost perpendicularly, yielding precipitation as they transit the ridgeline. The Waianae Range is downwind from the Koolaus, and receives less rainfall from the trades.

b. Temperature. Average daily temperatures mostly varied between 18° C (65° F) and 27° C (80° F). They peaked between June and October, and bottomed out between December

and February. Within the course of a day, the difference between minimum and maximum temperatures varied by 8° to 12° C (15-20° F).

c. Relative Humidity. The average relative humidity data from MMR varied more from day to day than temperature did, but most values fell in a relatively narrow band between 55 and 85 percent. The middle half of the relative humidity data ranged between 63 and 71 percent. Consistent compared to continental climates, these statistics are remarkably high, considering that the MMR weather station occupies a dry site, by Hawaiian standards.

d. Wind Speed. The daily average wind speed at MMR ranged from 1 m/s (2 mph) to 9 m/s (20 mph). Examining the relative frequency of the average wind speeds, we see that most of the values are at the lower end of the range. The middle half of the data assumed values between 2.7 m/s (6 mph) and 4.4 m/s (10 mph). The modal wind speed is approximately 2.7 m/s (6 mph).

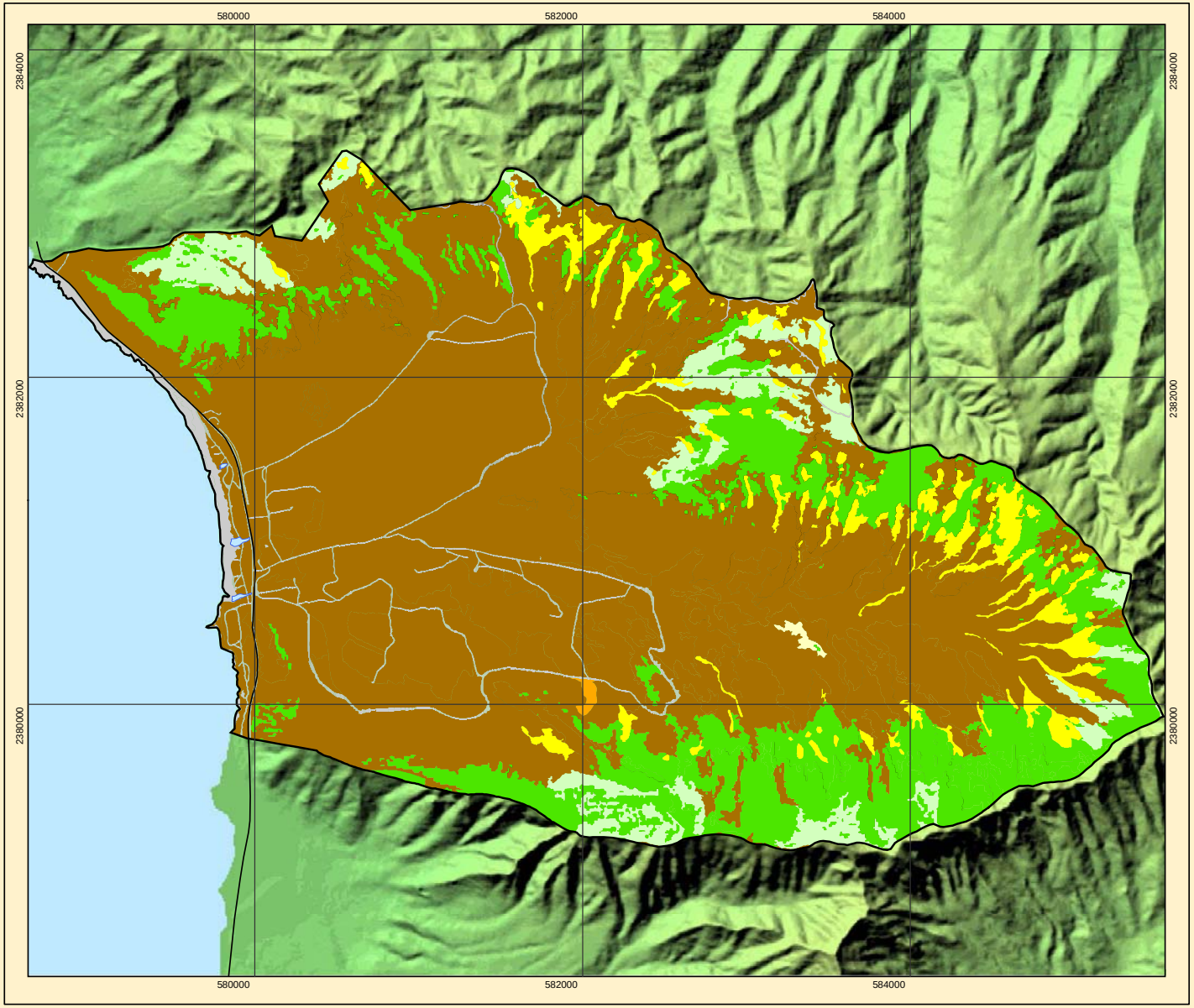
e. Topography. MMR is situated in a valley surrounded by steep slopes to the north, east, and south. The reservation extends from Farrington Highway along the coast to the Waianae Mountain Range ridgeline. It includes Kahanahaiki Valley, and the Koiahi Gulch. The reservation is about 1.5 miles wide as it is situated along the highway and approximately 2.5 miles deep at its deepest point. The valley floor varies from 8 to 162, (20 to 400 ft) in elevation. Cliffs that have heights of 850 to 1,174m (2,100 to 2,900 ft) surround the amphitheater-shaped valley.

7.5.2. Vegetation Fuels Classification.

The wildland fire fuel types found at MMR have been categorized into eight classes (Figure 9 and Table 7.5.1). These classes were derived from the National Forest Fire Laboratory (NFFL) fuel behavior models as defined by Anderson (1982). For a full description of Oahu fuel types and their derivation see Section 3.5.

Table 7.5.1
Fuel Types at MMR

Fuel Type	*Fuel Model*	*Vegetation Classifications Included (Genus only)*
Short Alien Grassland	NFFL 2	*Andropogon*
Tall Alien Grassland	Guinea Grass Custom	*Leucaena/Panicum, Melinis/Panicum, Panicum*
Eucalyptus Forest	NFFL 10	*Eucalyptus, Melaleuca*
Ironwood Forest	NFFL 9	*Casuarina*
Mixed Forest	NFFL 8	*Metrosideros/Acacia koa/Dicranopteris*
Christmas Berry Shrublands	NFFL 5	*Schinus*
Kukui Forest	Kukui Custom	*Aleurites*
Developed/Denuded	None	*Agriculture, Urban Development, Bog, Open Water, Roads*



Makua Military Reservation
Fuels

Figure 9

Legend

Fuels

- Christmas Berry Shrublands
- Developed/Denuded
- Ironwood Forest
- Kukui Forest
- Mixed Forest
- Short Alien Grassland
- Tall Alien Grassland

- Installation Boundary
- Surface Water Body
- Roads

N

1:25,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003
IKONOS 4 meter Multispectral Imagery

7.5.3. Fire History for Makua.

a. A fire history was compiled for Makua Military Reservation to the extent possible utilizing fire records provided by USARHAW Range Division and the Federal Fire Department (see also Reference 7.5.1). There were frequent gaps in important information, particularly in the acreage burned and the ignition source. Many records were destroyed following disposition of records (5 years) in accordance with Army record keeping policy.

b. Fire at MMR has been frequent in the past decade due in large part to the installation's extensive use, however, since it's closure in 1998 and subsequent limited reopening, there have been only two recorded fires, one of which was not military caused. Several fires have burned outside of the firebreak road, however, many of these started outside the firebreak, giving little indication of its effectiveness.

c. Significant points from the fire history are summarized below:

(1) The total number of fires per month illustrates that the end of the summer requires the greatest fire management vigilance, though there is also a fairly high incidence in March, April, and May.

(2) The vast majority of fires were ignited between 0900 and 1800.

(3) Median fire size is 0.1 hectares (0.25 acres), however, the average is 14.5 hectares (36 acres), indicating that there are several large fires accounting for most of the acreage burned. This is illustrated in Figure 5.

(4) The most significant cause of ignitions at MMR was tracers, which accounted for 48% of recorded fires. Tracers have been voluntarily removed from use at MMR by USARHAW, and are not currently authorized on the ranges

Reference 7.5.1
MMR Fire History

Figure 1
Number of Fires per Year
at MMR 1987 - 2002

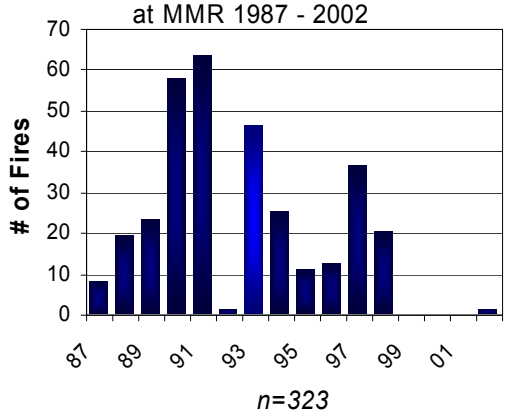


Figure 2
Number of Fires per Month
at MMR 1970-1998

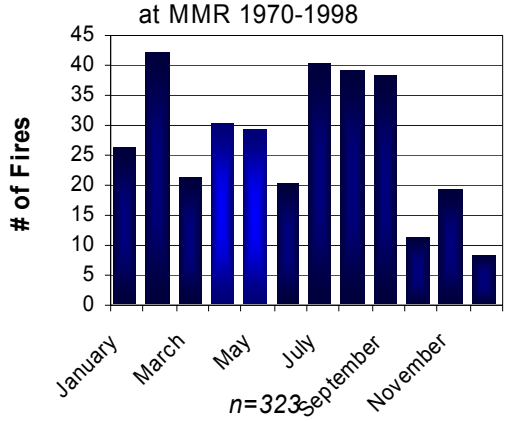


Figure 3
Number of Fires at MMR
by Time of Ignition 1970-1998

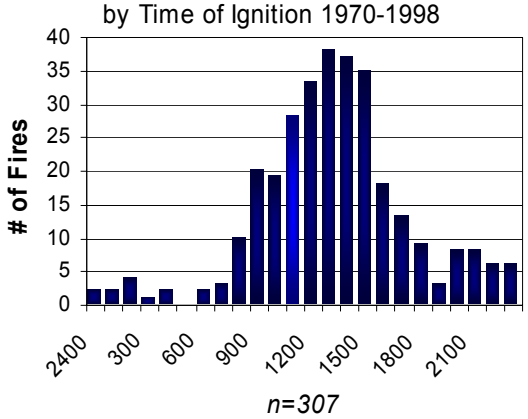


Figure 4
Number of Fires by Acreage Class
at MMR 1970-1998

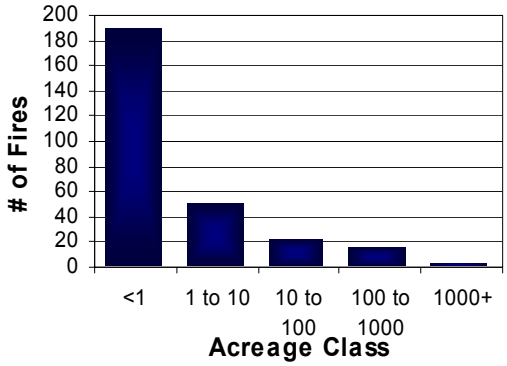
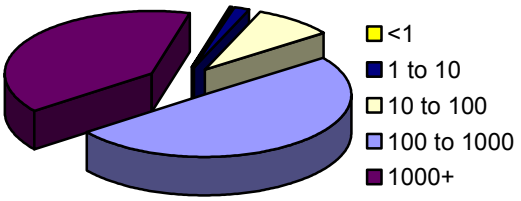
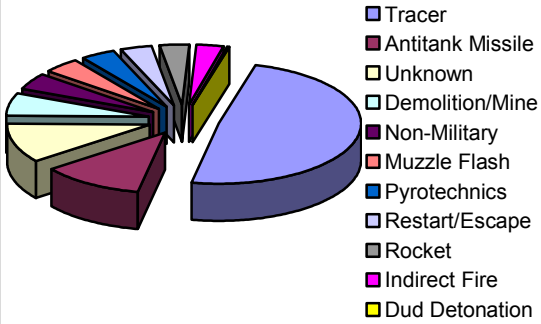


Figure 5
Percent of Total Area Burned 1970-1998 by Fire Size Class at MMR



n=276

Figure 6
Fire Ignition Sources as a Percent of All Fires From 1970-1998



n=325

7.5.4. Resource Protection

a. Biological Sensitive Areas (BSA). BSAs are delineated at MMR to assist in setting resource management priorities. BSAs depict areas with rare and/or endangered species. Training limitations are imposed on BSA-1 and BSA-2 areas, or those with the highest native natural resource value. (See Figure MMR-2)

(1) Portions of MMR have been designated BSA-1 and 2 areas. The BSA-1 and BSA-2 areas in MMR are located as follows:

a. BSA-1: an extensive area along the entire eastern half of the MMR boundary extending into the interior of the reservation;

b. BSA-1: a small area along the southern boundary beginning about one kilometer east of the coastline; and

c. BSA-2: a small area along the southern boundary beginning at Farrington Highway and extending east.

(2). Other sensitive natural areas at MMR include archaeological management areas, places where significant archaeological sites and/or structures (cultural resources) are known and require resource protection, and SEAs, areas designated for resource protection. SEAs combine protection of both natural and cultural resources (i.e., they contain BSA-1, BSA-2 and archaeological management areas).

(3) Nine native natural communities have been identified, two of which are considered rare. These BSAs are defined as habitat that contains or has the potential to contain a high density of federally listed threatened and/or endangered species.

b. Protected Species.

(1) The USFWS has identified numerous threatened and endangered species that are known to inhabit the area in around MMR. Table 7.5.3 lists these species and their status. Another native bird that has been identified at MMR, the Oahu Elepaio (*Chasiempis sandwichensis* ibidis), is proposed for endangered status.

(2) The existence of species of Hawaiian or Oahu Tree Snails (genus *Achatinella*) which were listed as endangered under the Federal Endangered Species Act of 1973 is of particular interest at MMR. Species of the *Achatinella* snail may be found above 900-foot elevations in the Waianae Range. The snails have been greatly reduced in number due to their extreme localization (often one species to a single tree), a low reproductive rate, virtually no defense mechanisms, and a general dependency on relatively intact native forest conditions. As a result, an assessment has been conducted of the distribution and abundance of snails of this genus within the boundaries of MMR (a live-fire and maneuver training area) to measure the environmental impacts on military training activities.

(3) Areas within MMR have been identified as *Achatinella* habitat, which has influenced the training activities that can be conducted. Studies have concluded that the greatest threat to the Oahu tree snail is the risk of fire and explosive impacts (Christensen and Hadfield, 1984). This resulted in limits being set for the explosive impact area to exclude known inhabited areas as well to provide buffer zones. Recommendations of the study have been implemented.

c. Cultural Resources.

(1) There are 51 known archaeological sites located at MMR. Archaeological inventory surveys of previously unsurveyed areas are conducted on a project-by-project basis. There are numerous archaeological sites located within the firebreak roads, which is where all training takes place. About 27 percent of MMR has been sampled by archaeological surveys and other sites may be present. Cultural resource management surveys conducted at MMR have identified prehistoric and historic sites, and areas that are likely to contain more sites have been identified.

(2) A map analysis indicates possible conflicts within the firebreak road where most training is conducted. Cultural resources outside the firebreak are much less likely to be adversely impacted by training. (See Figure MMR-2, Appendix 1, MMR SOP).

(3) Explosive detonation is the most common identified threat to cultural resources at MMR. The use of explosive ordnance has the potential to damage archeological sites. Climbing and walking on archaeological features can be very destructive and can result in the tumbling of stones and the alteration of the integrity of the feature.

d. Wildfire Prevention Analysis (Figure 10).

(1) The wildfire prevention analysis shows most of the area outside of the fuelbreak roads to be the highest priority for pre-suppression funding and implementation.

Unit A - Southern Firebreak

Ignition	-	High	Significant military activity, no tracers
Hazard	-	Moderate	Composed largely of *Panicum maximum*, but areas of heavy training use are mowed
Value	-	Low	No federally listed species

Unit B - Southern MMR

Ignition	-	Moderate	No military training, but in close proximity to heavy use areas
Hazard	-	High	Fuels are mostly composed of *Panicum maximum*, steep slopes
Value	-	Moderate	Several federally listed species

Unit C - Eastern and Northern MMR

Ignition	-	Moderate	No military training, but slight chance of overshot munitions
Hazard	-	High	Much of the area is dominated by highly flammable species
Value	-	High	Many federally listed species

Unit D - Northern Firebreak

Ignition	-	Moderate	No military training, but in close proximity to heavy use areas
Hazard	-	High	Fuels are mostly composed of *Panicum maximum*
Value	-	Low	No federally listed species

(2) By assigning values of 0, 1, and 2 to the low, moderate, and high designations respectively, and adding the values for ignition potential, hazard, and value, a priority level for each area has been determined:

Table 7.5.2
MMR Pre-Suppression Priority

Map Label	*Training Areas Included**	*Pre-Suppression Priority*
Unit C	Eastern & Northern MMR	5
Unit B	Southern MMR	4
Unit A	Southern Firebreak	3
Unit D	Northern Firebreak	3

7.5.5. Fire Protection

a. Firebreak System.

(1) MMR has an existing firebreak system that is designed to serve as control lines for fire containment and allow safe vehicle access for fire fighting personnel and equipment. (See Figure 11).

a. North Firebreak. The north firebreak is a roadway that completely circles the north training and impact area. Minimum training or live-fire takes place here. However, because of rough terrain, prescribed burning is usually the only fuel modification conducted in this area. Fuel loading within the north firebreak can be high depending on the last wildfire/prescribed burn.

b. South Firebreak. The south firebreak is a roadway that completely circles the south training and impact area. This is the critical firebreak since this is the area in which most of the training exercises takes place and where most of the fires start or escape. However, most of the fuel modifications are done here to prevent ignitions and fire escape.

c. Interior fire access roads within the south firebreak roads act as additional control lines during fire suppression. They serve to also assist with fuel modifications.

(2) Both firebreaks need to be maintained throughout the year to be effective. The MMR Range Operations Supervisor and the Wildland Fire Program Manager will coordinate with the Range Facility Maintenance Manager and Range Planner to develop an annual work plan that includes but is not limited to:

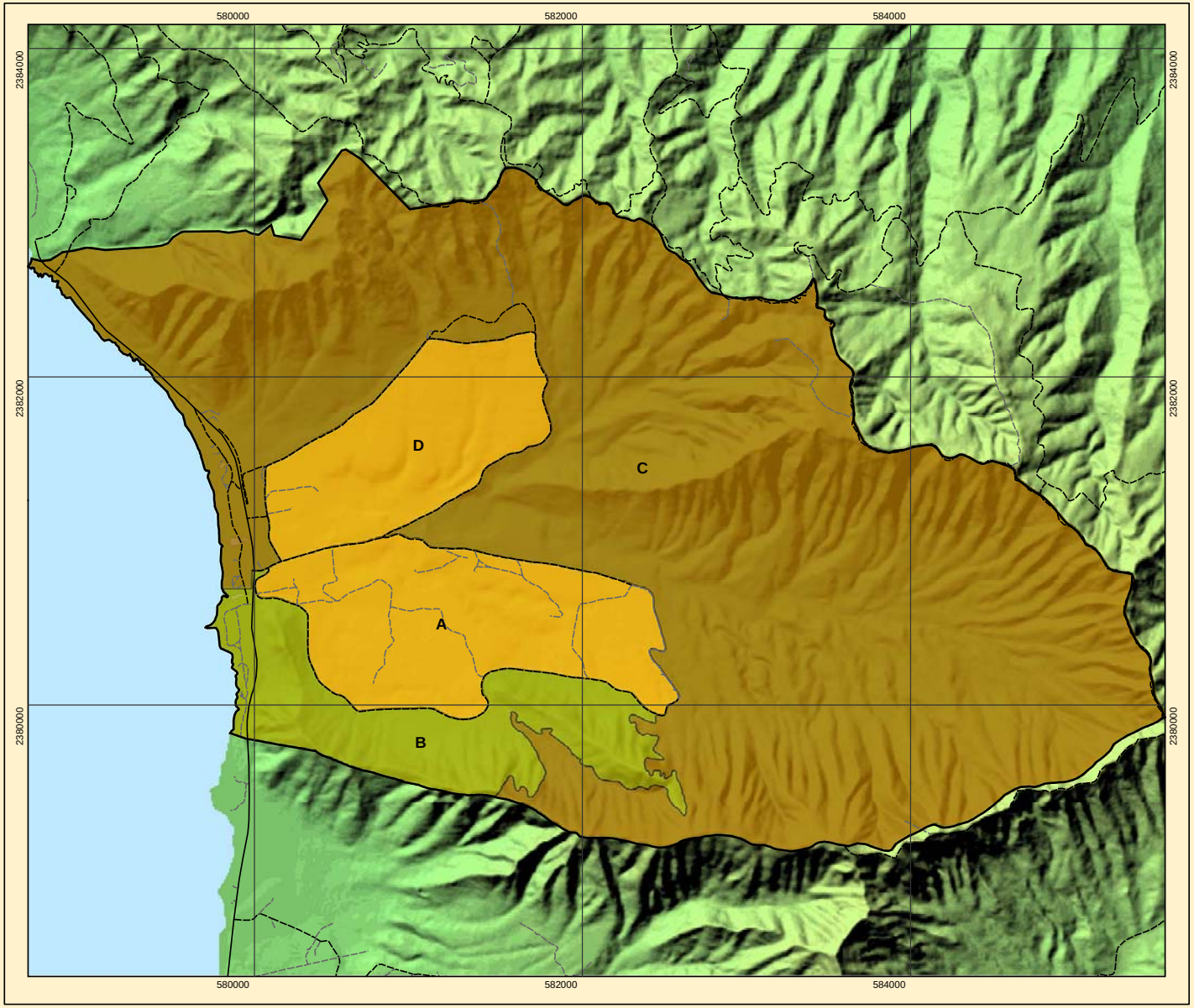
a. Capital improvements for new construction, maintenance and rehabilitation of existing fire/fuelbreaks.

b. Fuel modifications by mowing vegetation inside the firebreak road, providing terrain allows for the ability to reduce fuel loading (See Fuels Reduction below).

c. Chemical herbicide or growth retardant and prescribed burning techniques should be utilized whenever possible (See Fuels Reduction below).

d. Schedule of when firebreaks will be maintained throughout the year and by priority.

(This Page Intentionally Left Blank)



Makua Military Reservation
Pre-Suppression Priority

Figure 10

Legend

Pre-Suppression Priority

- None
- Low
- Moderate
- High
- Very High

Installation Boundary

Surface Water Body

Roads

- Primary
- Tertiary
- Unimproved

N

1:25,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003

b. Fuels Reduction.

(1) Burning, mowing, chemical herbicides and grazing will all be considered as potential fuels management alternatives (see Figure 11).

(2) Fuels at MMR have been managed for a number of years using mowing and herbicide application.

a. Many of the frequently used sites within the south lobe of the firebreak are mowed to stubble height regularly. This will be continued.

b. Herbicide is applied on both sides of a majority of the length of the firebreak roads. It is applied by boom sprayer to the greatest distance this method will allow. This will be continued.

(3) Prescribed burning will be considered as an alternative within the installation.

a. Most prescribed burning will occur within the firebreaks to keep fuel loads under control, thereby preventing a major fire.

b. Occasionally, it may be necessary to burn areas outside of the firebreak roads. This will be carried out under the supervision of a Type 1 qualified Incident Commander and only when deemed absolutely necessary. The utmost care will be taken to ensure that no escaped fires are allowed, extra resources are on site, and that containment lines are sufficient. No prescribed burns will be allowed outside of the flat valley bottoms.

c. Special considerations are necessary for any prescribed burn at Makua Military Reservation. Because Makua is highly sensitive culturally and environmentally, damage to resources from prescribed fires is not acceptable. Though there is always a risk of escape, it must be minimized to a greater degree at Makua by establishing a greater margin of error during the planning phase of the burn. This may mean that certain management objectives will have to be achieved using other means. The following restrictions will apply to all prescribed fires within MMR without exception:

i. The determination of whether to burn on a given day will not be influenced by cost or the demands of any agency or entity. The decision to burn will be decided entirely by the conditions of the fuels, current and predicted weather, the quality and quantity of resources on site, and the best judgment of the Burn Boss.

ii. No prescribed burn will be ignited or allowed to continue during the Red fire danger rating category.

iii. All considerations for any prescribed fire will assume worst case fuel conditions (i.e. fully mature guinea and molasses grass), regardless of the conditions in the intended burn area.

iv. The prescription window will be written such that the hottest conditions will produce flame lengths of no more than 4.45m (11 ft). This determination will be made using the Custom Guinea Grass fuel model within the BEHAVE fire prediction program. Estimates of live fuel moisture will be made using the rough guidelines established by the NWCG on page B-29 of the Fireline Handbook.

v. Regardless of the other conditions in the prescription window, the relative humidity will not be less than 55%. Fire behavior at Rh's less than this value are often extreme.

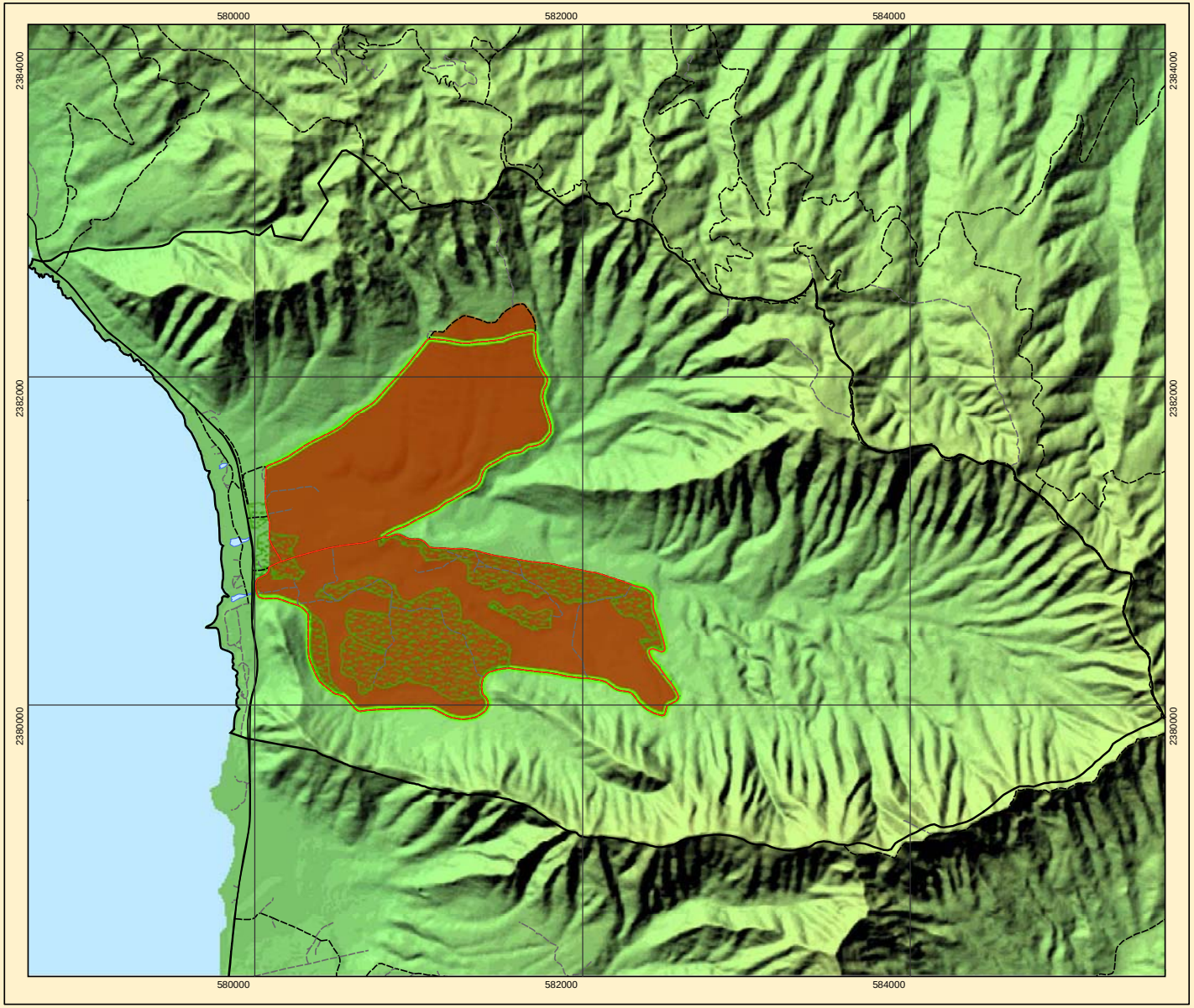
vi. Regardless of the other conditions in the prescription window, the maximum 20 foot windspeed will not be greater than 15 mph.

(4) Grazing will be considered as an option to control fuels, particularly within the northern half of the valley where there is very little training.

7.5.6 Project Budget FY 03 to 05*

PROJ/FEWR NO.	PROJECT TITLE	EST COST (x $1000)	FUNDED BY	FY
MMR 03-01/2	Prescribed Burn Plan 2- Settlement Agreement	**155**	IFSO	O3
TA100073J	Vegetation Control MMR	**330**	DPW ENV	O3
TA100083J	Upgrade MMR Water Distribution System	**90**	DPW	O4
TA100093J	Replace Dip Pond Liners at MMR	**60**	DPW TCCC	O4
EPR	Makua Implementation Plan (Wildfire Management)		DPW ENV	O4
	Total	**635**		

*See Annex I for the sustainment budget



Makua Military Reservation
Firebreaks and Fuels Management

Figure 11

Legend

- Firebreak
- Potential Prescribed Burning
- Herbicides
- Mowed Areas
- Installation Boundary
- Surface Water Body

Roads

- Primary
- Tertiary
- Unimproved

N

1:25,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003
USARHAW IFSO

Table 7.5.3
Federally Listed Species
Makua Military Reservation and Neighboring Lands*

Federal Status	Hawaiian / Common Name	Scientific Name
PLANTS:		
Endangered	Mahoe	*Alectyron macrococcus* var *macrococcus*
Endangered	None	*Alsinidendron obovatum*
Endangered	None	*Bonamia menziesii*
Endangered	Kamanomano	*Cenchrus agrimonioides* var. *agrimonioides*
Endangered	Akoko	*Chamaesyce herbstii*
Endangered	Pauoa	*Ctenitis squamigera*
Endangered	Haha	*Cyanea grimesiana ssp. grimesiana*
Endangered	Haha	*Cyanea longiflora*
Endangered	Haha	*Cyanea superba ssp. superba*
Endangered	Haha	*Cyrtandra dentata*
Endangered	Haha	*Delissea subcordata*
Endangered	Fern, no common name	*Diellia falcata*
Endangered	Na'ena'e	*Dubautia herbstobatae*
Endangered	Spurge	*Euphorbia haeleeleana*
Endangered	Mahamehame	*Flueggea neowawraea*
Endangered	None	*Hedyotis degeneri* var. *degeneri*
Endangered	None	*Hedyotis parvula*
Endangered	None	*Hesperomannia arbuscula*
Endangered	Pepperwort	*Lepidium arbuscula*
Endangered	Nehe	*Lipochaeta tenuifolia*
Endangered	None	*Lobelia niihauensis*
Endangered	None	*Lobelia oahuensis*
Endangered	None	*Neraudia angulata* var *angulata*
Endangered	None	*Neraudia angulata* var *dentata*
Endangered	Kului	*Notorichium humile*
Threatened	Makou	*Peucedanum sandwicense*
Endangered	None	*Phyllostegia kaalensis*
Endangered	Laukahi kuahiwi	*Plantago princeps* var *princeps*
Endangered	Loulu	*Pritchardia kaalae*
Endangered	Snakeroot	*Sanicula mariversa*
Endangered	None	*Schiedea hookeri*
Endangered	None	*Schiedea kaalae*
Endangered	None	*Schiedea nutallii* var. *nutalii*
Endangered	None	*Silene lanceolata*
Endangered	None	*Spermolepis hawaiiensis*
Endangered	None	*Tetrmalopium filiforme* (both varieties)
Endangered	Opuhe	*Viola Chamissoniana ssp. Chamissoniana*
Animals:		
Endangered	Oahu tree snail	*Achatinella mustelina*
Endangered	Oahu elepaio bird	*Chasiempis sandwichensis gayi*
Endangered	Oahu creeper bird	*Paroreomyza maculata*
Endangered	Hawaiian hoary bat	*Lasiurus cinereus semotus*

*According to Biological Assessment for Programmatic Section 7 Consultation on Routine Military Training at Makua Military Reservation. November 2, 1998.

7.6. POHAKULOA TRAINING AREA (PTA)

7.6.1. General Description.

a. Location and Size. PTA is located on the Big Island of Hawaii in the saddle in between three volcanoes: Mauna Loa, Mauna Kea, and Hualalai Mountain. The area consists of 44,027 hectares (108,792 acres) of which 34,323 (84,815 acres) are ceded; 9,694 (23,954 acres) are leased (9,296 from the State, 2 from the Mauna Kea Property and 397 from the Smart Trust); 9 hectares (23 acres) are Easement /License/Permit. There are 232 hectares (574 acres) in the cantonment area. The Keamuku parcel is located just to the northwest of PTA proper and covers roughly 9,308 hectares (23,000 acres). This property may be purchased by the Army in the near future to facilitate SBCT training.

b. Military Land Use. The types of land uses at PTA include cantonment, airfield, maneuver training areas, live-fire ranges, and training areas unsuitable for maneuver. The 22 live-fire training ranges are located in the northern and eastern portions of the reservation. There are 144 hectares (357 acres) for range use, 7,749 hectares (19,148 acres) suitable for maneuver training, and the PTA cantonment area encompasses an additional 232 hectares (574 acres). This leaves 15,185 hectares (37,523 acres) considered as unusable acreage for maneuver training and range use within the installation boundary. An additional 23,367 hectares (57,740 acres) of leased properties are available as occasional use land. However, these occasional use areas carry many restrictions with them. These restrictions range from considerations of calving seasons to maneuver restrictions. The ranges and artillery firing points located in surrounding maneuver areas are oriented so munitions are fired toward the impact area of approximately 20,639 hectares (51,000 acres) within the central portion of PTA. There are two exceptions to this: Two M16 ranges are currently oriented to the east. These ranges are scheduled to be closed. Keamuku, should it be purchased, will be used for maneuver training.

c. Training Capabilities. PTA is the largest contiguous training area in Hawaii. The impact area supports all weapons assigned to the 25th ID(L) and USARHAW. The large areas around the impact area support maneuver training. All conventional weapons and munitions can be used in the ceded land portion at PTA. PTA also supports Infantry Brigade Task Force Deployments, Artillery Live-Fire, Attack Helicopter Gunnery, Air Defense System Live-Fire, Air/Ground Operations, Combined Arms Live-Fire, and Parachute Drops.

d. Climate. Temperatures are mild with cool nights due to the high elevations. The annual mean temperature in the lower elevations at PTA is about 15.6 and 10° C (60° F and 50° F) at higher elevations. The area is subject to occasional fog and frost, with frequent light rains in the winter months. The area is also subject to “vog”, a term used by local people to describe foggy conditions due primarily to emissions of volcanic dust and ash. Winds tend to be gustier during the winter, while light winds continue in the dry summer months.

(1) Rainfall. Average annual rainfall is 38cm (15 inches). Annual rainfall is variable because PTA is in the middle of a trade wind inversion zone between 2,023 to 2,823 (5,000 to 7000 ft) in elevation. Even a 100-meter change in elevation or in location can make a noticeable difference in atmospheric conditions.

(2) Temperature. Temperatures at PTA show very little variation throughout the year, though reports of frost or snow at higher elevations occur periodically. The average annual temperature from 1996 to 1998 was 17.7° C (63.8° F) (average monthly max=19.6° C (67.2° F)

in July and average monthly min=15.3° C (59.6° F) in February (Fujioka and Haught, unpublished data)).

(3) Relative Humidity. Average relative humidity is about 70 to 80 percent in windward areas below the inversion level and less than 40 percent above.

(4) Wind. Prevailing winds over the island are generally from the northeast, but other winds, especially from the south through the west, are not uncommon. Localized patterns are quite variable, as influenced by Mauna Kea's mass and numerous prominent terrain features. The effect of topography can vary appreciably even with moderate deviation in wind velocity and direction, causing inconsistent wind behavior that is not readily predictable. Winds are generally out of the east in the mornings until orographic winds from the west overpower the trades in the early afternoon. This wind shift from easterly to westerly winds depends largely on the strength of the trades and the amount of cloud cover blocking radiative heating of the ground. During the transition period, winds are highly unpredictable in strength and direction. It is not uncommon for winds to shift 180 degrees over very short periods of time or distance. Average annual 20-ft wind speeds at Bradshaw Army Airfield from 1996 to 1998 were 10.7 mph (Fujioka and Haught, unpublished data) with very little variation from month to month (average monthly max=11.85 mph in December, average monthly min=9.72 mph in June). Constant vigilance to wind conditions is critical during fire protection.

e. Topography. PTA is in a "dry tropical upland (tropical sub-alpine dry land) biome unique to the Hawaiian Islands. The area is volcanic lava plateau, or plain, dotted with "puu" (cinder cones), and underlain by igneous beds. Slopes rise from the lava plateau between Mauna Kea to the north and Mauna Loa to the south of PTA. This plateau is referred to as the "saddle" area of the island. The elevation differences within PTA between lowest area of the plateau and the Mauna Kea slope range from 1,631m to 3,501m (4,030 to 8,650 ft).

7.6.2. Vegetation Fuels Classification.

The wildland fire fuel types found at PTA on the island of Hawaii are very different from those on Oahu. Plant Communities were mapped by Castillo *et. al.* (1997). These were grouped into six (6) classes to aid in mapping (Figure 12). These classes were derived from a set of fuel models described by Anderson (1982) representing fire behavior fuel models. Corresponding PTA Plant Community Types [PCT], per Castillo *et. al.* are shown in brackets.

a. Barren and Sparsely Vegetated Lands. [PCT 1, 2, 9, and 24].

(1) Lands dominated by barren lava or lava possessing a discontinuous and open vegetation structure. These lands comprise the majority of PTA. They do not have fuel loads sufficient to carry fire and are suitable to use as natural firebreaks.

(2) Fuel Model Correlate: None

b. Perennial Grassland. [PCT 22 and 23]

(1) Land dominated by perennial alien (*Pennisetum setaceum*) and native (predominately *Eragrostis atropioides*) grasses averaging about 1 meter in height. Found primarily on older substrates having relatively developed soils (~10,000 years old), however, some *P. setaceum* dominated lands are found on younger lava. These grasslands extend down slope from PTA on

the leeward side of Hawaii in the North Kona and South Kohala districts below 1900 m (6232 ft MSL). Fine fuel loads are usually continuous and 0” to 3” deep. Grass litter accumulation is usually high.

(2) Fuel Model Correlate: 1

c. Lowland Montane Shrubland. [PCT 6, 11, and 21]

(1) Land dominated by low-structure shrubs or a mixture of low-structure shrubs and annual and perennial grasses. Includes *Dodonaea* shrubland, *Myoporum* shrubland and *Chenopodium* shrubland. Found primarily on Mauna Kea substrate with relatively developed soils. Grass and shrub litter accumulates to form continuous fine fuel loads, which carry flame lengths of 2-3 m on the average (observation). These shrublands occupy portions of the Pohakuloa plain along Saddle Road (2,428m or 6,000 ft) and parts of the Kipuka Kalawamauna down slope into the lowland regions of Puu Anahulu and Puu Nohonaohae (1,009m or 2,493 ft). These shrublands burn frequently (every 1-4 years).

(2) Fuel Model Correlate: 2

d. Tall Montane Shrubland and Scrub. [PCT 7, 8, 10, 13, 14 and 20]

(1) Land possessing vegetation that is dominated by a mixture of taller (>2 m) woody plant species in a relatively dense structure. A continuum of fine fuels in the understory creates an environment where fire is easily carried. This fuel type includes dense mixtures of woody and herbaceous plants in the Kipuka Alala and other relatively old Mauna Loa kipukas, and the Dodonaea mixed shrubland and Chamaesyce treeland of Kipuka Kalawamauna. These types occur below 2,428m (6,000 ft). Observed flame lengths in this type average 3-4 meters.

(2) Fuel Model Correlate: 3

e. Subalpine Open Treelands and Low Shrub. [PCT 3 and 4]

(1) These plant communities exist on Mauna Loa lava where soil development is minimal. The overstory is sometimes scattered with Ohia (*Metrosideros polymorpha*) trees and the understory is made up of a mixture of Alii (*Dodonaea viscosa*), Pukiawe (*Styphelia tameiameia*), and Ulei (Osteomeles anthylidifolia). Herbaceous fuel loads are low, however, in many of these areas the shrub layer is dense enough to carry a fire. These types occur in the southwestern and southeastern portions of PTA up to 2,655 (6,560 ft).

(2) Fuel Model Correlate: 4

f. High-stature Upland Shrub. [PCT 12, 15, 16, 17, 18 and 19]

(1) Land dominated by some form on the Naio (*Myoporum sandwicensis*) and Mamane (*Sophora chrysophyla*) tall shrub formation. These vegetational associations vary in quantity of fine fuels in the understory and density of the shrub overstory. On younger lava, this type can possess an open or closed stand structure and has little herbaceous material in the understory. On older sites, like those on the slope of Mauna Kea, and in older kipukas of Mauna Loa, native and alien grasses create a continuous fine fuel bed in the understory. At PTA these types occur below 3,035m (7,500 ft).

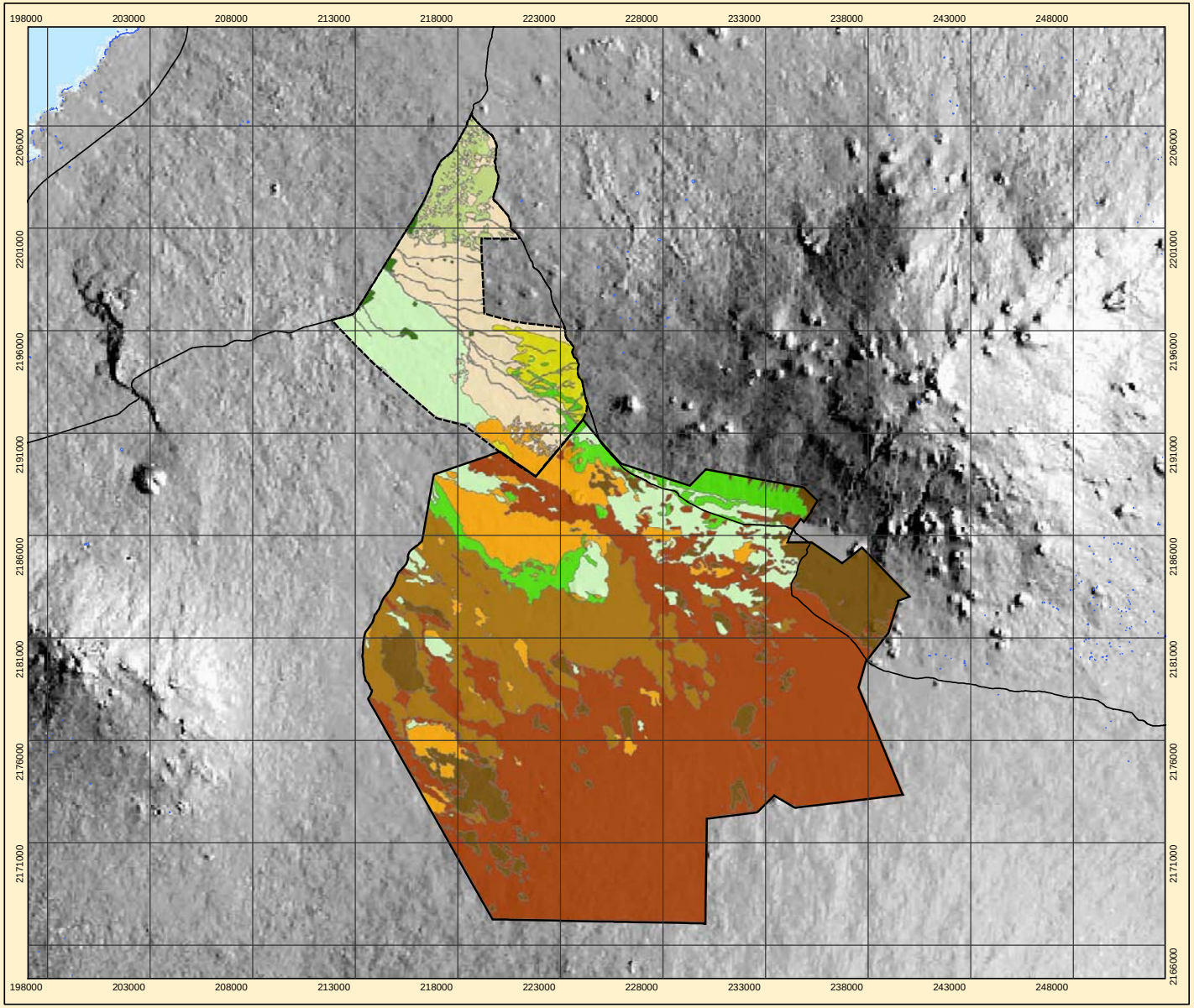
(2) Fuel Model Correlate: 5

g. Ohia Mixed Treeland. [PCT 5]

(1) This fuel type is restricted to middle-aged Mauna Loa lava between below 2,124m (5,248 ft). The overstory is dominated by Ohia and other native tree species (*Myrsine lanaiensis, Myoporum sandwicensis,* and *Santalum paniculatum*), while the understory is a continuous fuel bed of shrub grasses and forbs.

(2) Fuel Model Correlate: 6

(This Page Intentionally Left Blank)



Pohakuloa Training Area
Fuels

Figure 12

Legend

Fuels

- Dense Shrub
- Eucalyptus
- Grass/Shrub Mix
- Intermediate Shrub
- Grass
- Lava
- Mature Shrub
- Open Treeland
- Shrub w/ Grass Understory
- Rangeland
- Sparse Shrub

- Installation Boundary
- Keamuku Parcel
- Surface Water Body
- Primary Roads

N

1:200,000

0 2,500 5,000 Meters

0 2.5 5 Miles

Data Source: Shaw & Castillo 1997
Arnett 2002

7.6.3. Fire History for PTA.

a. Historically, fire in the area of PTA was most likely rare and of little significance, limited to volcanically started fires and occasional lightning ignitions. Military use for live-fire exercises and target practice has increased ignition frequency dramatically and resulted in numerous small fires, though it appears that much of the threat to endangered species populations is a result of off post ignitions.

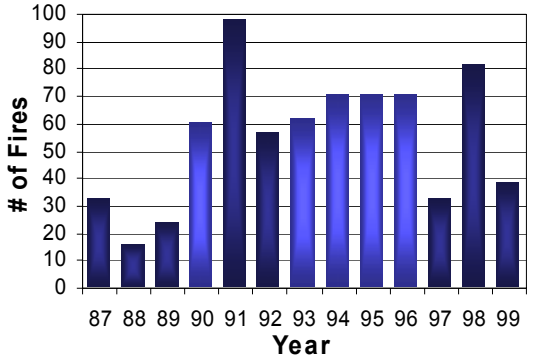
b. Fire history at PTA was inferred as best as possible from existing fire records and documentation provided by various agency sources. Fire records were numerous for PTA but most were incomplete. Many records included a date, time, and location for each fire but very little information was available about the size of fires or the weather conditions during the fires. (See Analysis of Fire Management Concerns at PTA, Beavers and Burgan2000).

c. Fires caused by tracer ammunition is by far the largest cause of fires at PTA. This comes as no surprise since tracers easily start fires and are one of the most commonly used munitions. It is important to note that fires originating from non-military sources have caused the overwhelming majority of the acres burned at PTA. Since July 1990, over 3,237 hectares (8,000 acres) have been recorded as burned. Of these, over 3,116 hectares (7,700 acres) or 91% of all acres burned, were burned by fires caused by lightning, arson, or carelessly discarded cigarettes, and the largest of these started off of Army lands and later burned into PTA (Refer to Reference 7.6.1).

d. Based on fire history for PTA, the data show that the western and the northern sections of PTA potentially face the greatest threat of wildfire. Military training activities have been the leading cause of past fires. The high risks inherent in military training activities, the existence of heavy loads of readily ignitable fuel, and the prevalent dry conditions of the area present significant fire management problems for the training area and adjoining lands.

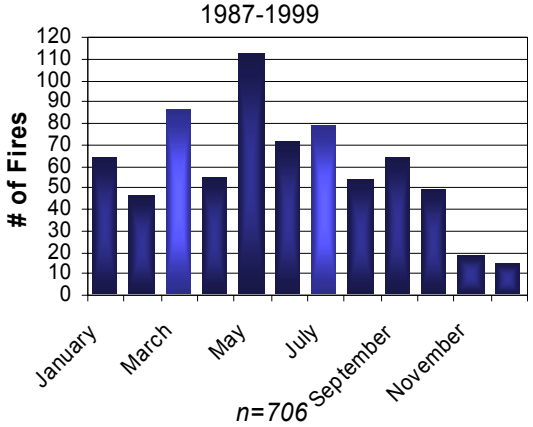
Reference 7.6.1
PTA Fire History

Figure 1
Number of Fires per Year at PTA
1987-1999



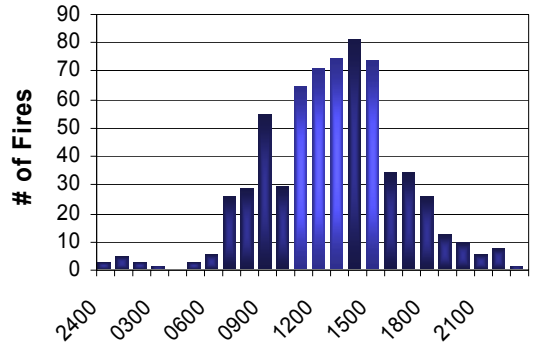
n=706

Figure 2
Number of Fires per Month at PTA
1987-1999



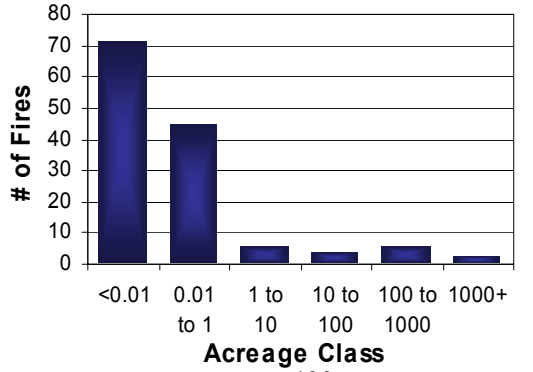
n=706

Figure 3
Number of Fires by Time of Ignition
at PTA 1987-1999



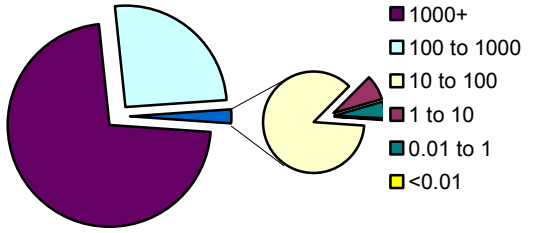
n=641

Figure 4
Number of Fires by Acreage Class at PTA
1987-1999



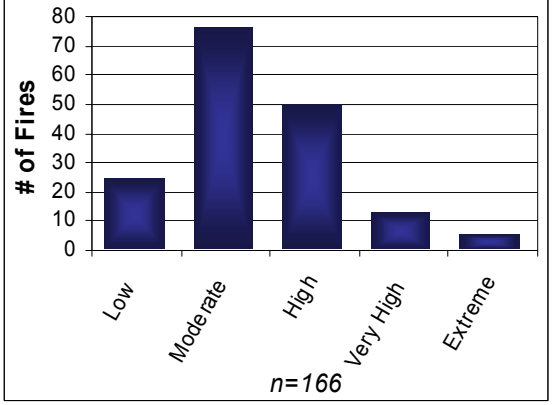
n=130

Figure 5
Percent of Recorded Area Burned
1987-1999 by Fire Size Class at
PTA



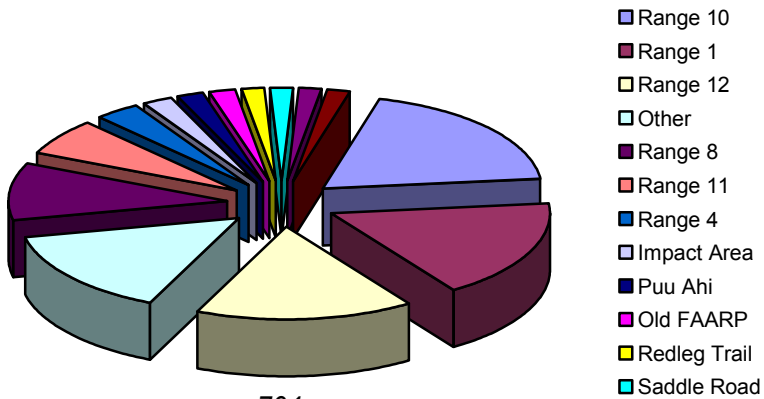
n=130

Figure 6
Number of Fires Occuring in Each Fire
Weather Rating at PTA 1987-1999



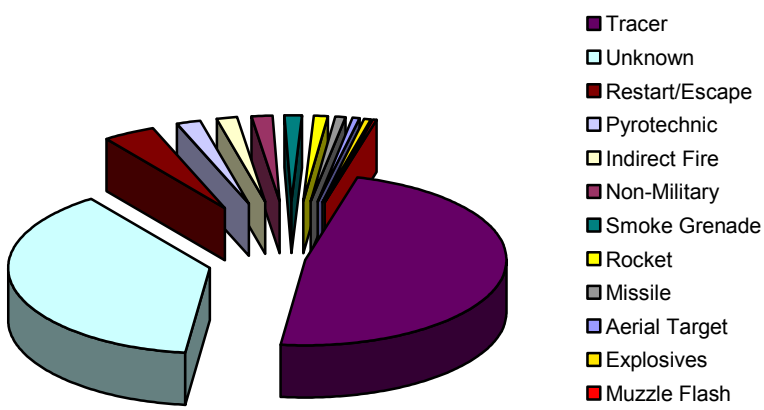
n=166

Figure 7
Percent of All Fires by Location at PTA
1987-1999*



n=704
*Areas with fewer than 10 recorded fires are included in the "other" category.

Figure 8
Percent of All Fires by Ignition Source at PTA
1994-1999



n=361

7.6.4 Resource Protection.

a. Biological Sensitive Areas (BSA).

(1) Relative to many other areas in the state, PTA contains an abundance of biological resources (Figure PTA-2). The majority of the training area is vegetated with native Hawaiian plants. In addition, rare terrestrial and subterranean community types are becoming better known. The training area is also home to the endangered Hawaiian Hoary Bat and rare endemic land snails. The HINHP guidelines are followed throughout all training sites.

(2) PTA has eight BSA-1 sites. Seven of these, including the three largest regions, are in the north and west quadrants of the training area. The majority of these sites are located west of the impact area.

(3) There are numerous BSA-2 sites at PTA. Much of the Palila Critical Habitat Area is designated a BSA-2 site, as is most of Kipuka Kalawamauna outside the Endangered Plant Habitat Area. Other BSA-2 sites include mamane/naio forest and shrub land patches in the impact area and the Mauna Kea slope area.

(4) Other sensitive areas at PTA include archaeological management areas, places where significant archaeological sites and/or structures (cultural resources) are known and require resource protection, and SEAs, areas designated for resource protection and subject to the training guidelines contained in the Ecosystem Management Plan Report for Pohakuloa Training Area. SEAs combine protection of both natural and cultural resources (i.e., they contain BSA-1s, BSA-2s and archaeological management areas).

b. Protected Species.

(1) PTA has approximately 5,466 hectares (13,507 acres) of endangered species habitat in the range and training areas on the installation, which are indicated on the 1994 Training Area Map prepared by the 29th Engineer Battalion at Schofield (Sheet: PTA, Series: W731S, Edition: 6-29). Designation as a federal endangered species requires the most protective resource management activities.

(2) Critical habitat for the endangered Palila has been designated on the installation. The Palila is found only in the mamane/naio dry forest, high on the slopes of Mauna Kea between 2,428m and 3,642m (6,000 and 9,000 ft) on the island of Hawaii. It feeds almost exclusively on the immature seeds of the mamane tree. The critical habitat area for the Palila covers all of TAs 2 and 10, and portions of TAs 1, 3, 4, and 11.

(3) Eleven plants identified on the installation are designated as endangered and one as threatened. Seven other species are considered as species at risk and are being monitored (Table 7.6.3).

c. Cultural Resources.

(1) Over 250 sites have been located and recorded at PTA with present total of approximately 14,973 hectares (37,000 acres) or approximately 60 percent of non-impact area surveyed. The DPW Environmental Division, Conservation & Restoration Branch carries out all Federal and State compliance requirements for both natural and cultural resources at PTA.

Two full-time staff at PTA carry out a Scope of Work (SOW) developed by the US Army Garrison-Hawaii Cultural Resources Manager. This SOW includes pedestrian survey and active monitoring of sensitive sites, cultural resource awareness actions, and maintenance of an extensive cultural resource database. Other administrative procedures have been developed to ensure that major construction activities procedures are similarly managed. Identified sites at the installation are recorded with the Hawaii State Historical and Archaeological Site Files. Cultural resource inventories are maintained by the DPW, Cultural Resources Team.

(2) About seventy percent of the 250 known archaeological sites are subterranean lava tube sites. Site concentrations are located primarily in the eastern and western areas of PTA. Native Hawaiians used lava tubes for shelter, collection of water condensation or percolation, and procurement of birds. The lava tubes were also used as places for collection and processing of natural resources. The Bobcat Trail Habitation Cave is the only PTA site listed on the National Register of Historic Places. The remaining 30 percent of sites include lithic workshops, shrines, and volcanic glass quarries and excavated pit complexes, believed to have been used in attracting and capturing sea birds.

(3) Formal significance evaluations and determinations for archaeological sites at PTA has not taken place except for volcanic glass quarries located on the east side of Red Leg Trail (Garcia and Associates 2002- Archaeological Survey of Training Areas 5 and 21 and Eligibility Evaluations of Volcanic Glass Quarry Sites Vicinity of Redleg Trail (Range 10), U.S. Army Pohakuloa Training Area, Island of Hawaii, Hawaii). All sites are managed as if formal until determined otherwise. All but a few of the known sites at PTA are prehistoric-era resources related to the historic context, “Traditional Native Hawaiian Adaptations to the Saddle Region, Hawaii Island.” However, potential for contributing important information about historical context varies among property types and complexity.

(4) Archaeological sensitivity (the probability of finding additional sites or structures) appears to be highest on tube-fed Pahoehoe lava flows, older that 2,000 years, based on the known sites of PTA. These areas are concentrated in Training Areas 21, 22 and 23 and, and appear in small patches in Training Areas 3 and 5. Moderate sensitivity areas are predicted in south and northeast portions of PTA. Low sensitivity is expected in much of the impact area and on a’a lava flows.

(5) Use of archaeological sites by troops has the potential to damage these resources. This includes any occupation or use of an archaeological site by troops during military training, or any troop concentrating activity (e.g., bivouac) in areas of high archaeological sensitivity. The operation of vehicles off of trails and roads on PTA presents a serious threat to both surface and subsurface resources on Army lands. The vehicles can tumble and destroy surface features or damage vegetation, causing erosion and consequent destruction of subsurface features. Another potential conflict between training activities and cultural resources at PTA is the inadvertent excavation of archaeological sites. The Historic Preservation Plan for Pohakuloa Training Area (Garcia and Associates 1995) notes that military impacts were visible in only four percent of research plots monitored at PTA under the Army’s ongoing Land Conditional-Trend Analysis program. Soldiers are instructed to report any chance discoveries of previously unknown sites. Many cultural resources sites throughout the range and training areas have been identified. According to the HPP risk assessment, the high and moderate risk areas of PTA are in the vicinity of firing points. See also PTA External SOP.

d. Wildfire Prevention Analysis

(1) Five wildfire areas have been designated based on existing and planned fuel management corridors (see Section 7.6.5 h(2) and Section 4.3). The impact area is not considered because pre-suppression activities there are not possible and resources at risk are largely unknown. Each area was assigned an ignition potential, hazard, and value based upon the best currently available information. The ratings listed below were agreed upon by representatives of the USFWS and USARHAW. The resulting Pre-Suppression Priority map (Figure 13) shows that Kipuka Kalawamauna, Mauna Kea, and Kipuka Alala areas are at highest risk.

Unit A – Kipuka Kalawamauna

Ignition	-	Moderate	Restricted training and maneuvers, fire threat from Puu Anahulu
Hazard	-	High	Heavy shrub fuels mixed with *Pennisetum setaceum*
Value	-	High	22 of 25 total rare and endangered plant species

Unit B – Mauna Kea

Ignition	-	High	Heavy military activity
Hazard	-	Moderate	Fine fuels or shrubs with little understory in discontinuous fuelbeds
Value	-	High	Adjacent to Critical Habitat and Palila core population, and 9 rare and endangered species

Unit C – Kipuka Alala

Ignition	-	Low	No military training, little human activity
Hazard	-	High	Heavy shrub fuels with fine fuels in the understory, few existing firebreaks
Value	-	High	17 of 26 total rare and endangered plant species

Unit D – Redleg Trail

Ignition	-	High	Heavy military activity
Hazard	-	Low	Mostly barren, isolated vegetated areas, fires easily contained
Value	-	Low	2 of 26 total rare and endangered plant species

Unit E – Mauna Loa

Ignition	-	Moderate	Occasional firing of fire prone weapons, little human activity
Hazard	-	Low	Sparsely vegetated and barren lands
Value	-	Low	No known listed species

Unit F – Keamuku

Ignition	-	High	Military activity expected to be heavy, pyrotechnics authorized
Hazard	-	High	Expected removal of grazing will increase fuel load and continuity
Value	-	Low	Several scattered populations of listed species

(2) By assigning values of 0, 1, and 2 to the low, moderate, and high designations respectively, and adding the values for ignition potential, hazard, and value, a priority level for each area has been determined.

Table 7.6.1
PTA Pre-Suppression Priority

Map Label	*Location*	*Pre-Suppression Priority*
Unit A	Kipuka Kalawamauna	5
Unit B	Mauna Kea	5
Unit C	Kipuka Alala	4
Unit F	Keamuku	4
Unit D	Redleg Trail	2
Unit E	Mauna Loa	1

7.6.5. Fire Protection.

a. Firebreak System.

(1) Given the weather, topography, and fuel conditions which make fire suppression at PTA difficult, the implementation of adequate pre-suppression measures is all the more important for minimizing fire loss. Serviceable access roads and firebreaks should be of highest priority, as they can be reasonably implemented and provide an effective fire management tool when properly planned and maintained.

(2) Existing roads will serve as firebreaks. Pre-constructed firebreaks need to be negotiable by 4WD vehicles to facilitate fire and management access. The recommended standards/requirements for roads and firebreaks for PTA are outlined in Section 4.3. All firebreak/fuelbreak measurements are additive (e.g. a 9 meter firebreak combined with a 25 meter fuelbreak results in firebreak/fuelbreak combination of 34 meters in width).

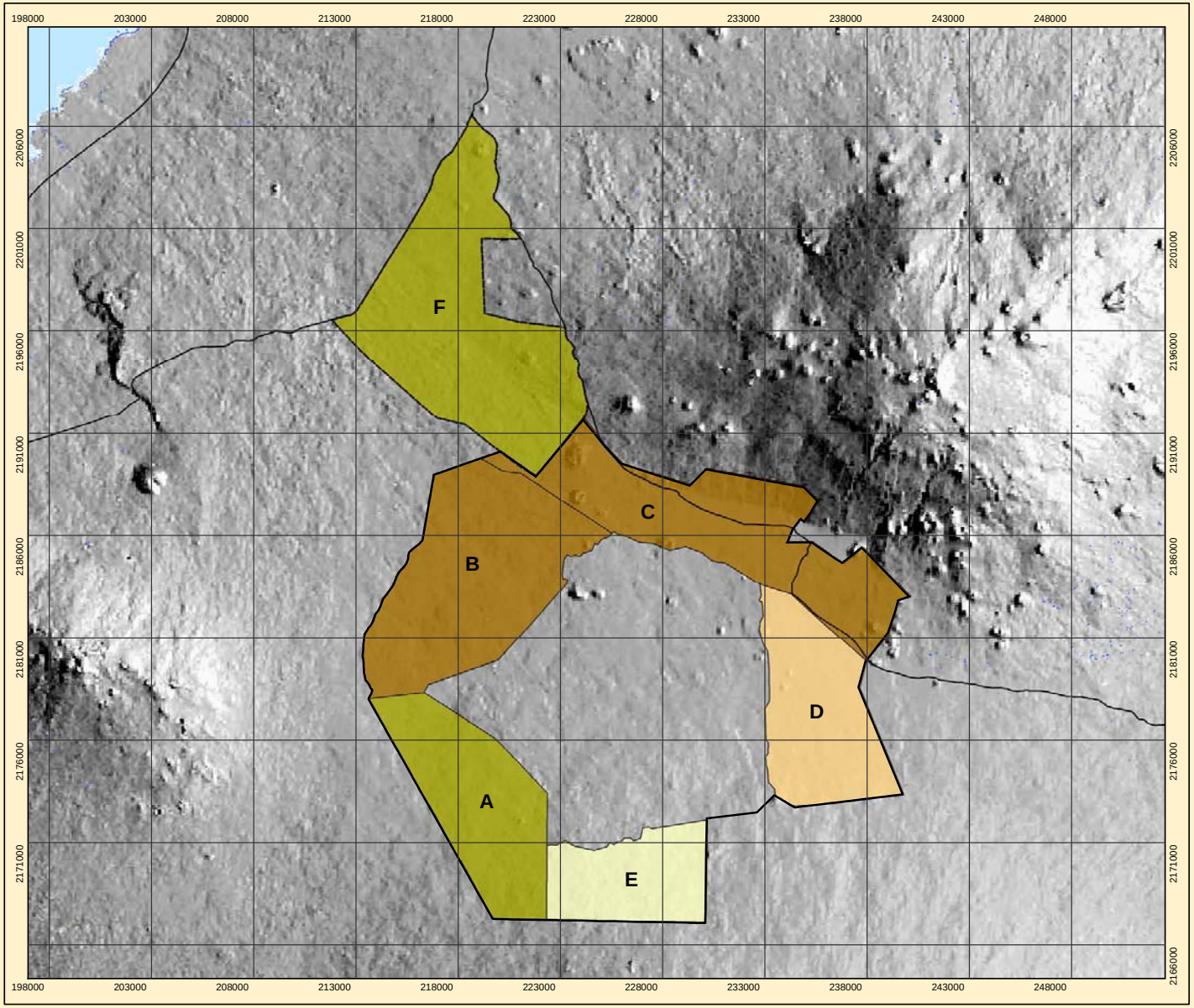
(3) Most firebreaks at PTA will be combined with a fuelbreak to increase their effectiveness.

(4) Six firebreaks are or will be constructed at PTA (Figure 14).

a. Western Firebreak – This break starts at the Keamuku lava flow and proceeds south along the western boundary of PTA, between Kipuka Kalawamauna and Puu Anahulu, to the 1859 lava flow. It consists of a firebreak combined with a fuelbreak. The firebreak will vary in width, but will never be less than 9 meters across. The associated fuelbreak will vary in width depending on the fuel type through which it is passing. In grassy areas it will be 25 meters wide, while in shrub or forest areas it will be 45 meters wide. Fuels within the fuelbreak will be maintained at less than 20% crown cover. Fuels will be kept discontinuous and pockets of fuels will be removed. The fuelbreak will be monitored annually via calibrated ocular estimation.

b. Northern Firebreak – This break starts on the northern side of the Keamuku flow, travels north along Keekee road to an existing powerline road that runs along the northern side of the installation. It follows this to the eastern boundary of the installation where it turns south and follows the installation boundary to Saddle Road. This firebreak will also be combined with a fuelbreak. The firebreak will be no less than 4.5 meters wide, and the fuelbreak will vary from 25 to 45 meters wide as described above. This break will largely be replaced by the realigned Saddle Road in the future. The roadbed including shoulders will be greater than 4.5 meters wide. The fuelbreak will continue to be maintained along the south side of the road.

(This Page Intentionally Left Blank)



Pohakuloa Training Area
Pre-Suppression Priority

Figure 13

Legend

Pre-Suppression Priority

- None
- Low
- Moderate
- High
- Very High

- Installation Boundary
- Keamuku Parcel
- Surface Water Body
- Primary Roads

N

1:200,000

0 2,500 5,000 Meters

0 2.5 5 Miles

Data Source: Center for Environmental Management of Military Lands 2003

c. Twin Puus – A firebreak will follow the existing MPRC Access Road to prevent fires from within the impact area from moving into Kipuka Kalawamauna. The firebreak will be 4.5 meters wide. It will not be combined with a fuelbreak, though fuels along the road will be managed via herbicide if populations of listed species are not present.

d. Keamuku – This will extend from the end of the Keamuku flow to Mamalahoa Highway. The firebreak will be 4.5 meters wide and will be combined with a fuelbreak of 25 to 45 meters in width and will be maintained and monitored as described above. The firebreak will be extended as necessary to account for the encroachment of *Pennisetum setaceum* onto the Keamuku lava flow. Extensions will be added wherever crown cover of vegetation exceeds 20%. The flow will be monitored annually as described above.

e. Keamuku Puus – These two firebreaks will be protect Nahaonaehoe cinder cone and Puu Papapa, which harbor a number of listed species, from fires in the Keamuku Parcel. They will be 4.5 meters wide and will not be combined with a fuelbreak. These breaks will be maintained annually.

(6) Two fuelbreaks will be established in Keamuku.

a. Mamalahoa Highway – A fuelbreak of 25 to 45 meters wide will be established on the east side of Mamalahoa Highway within Keamuku. The width will vary depending on the vegetation as described above. Mamalahoa Highway will serve as the firebreak and necessitates no maintenance on the part of the Army.

b. Old Saddle Road – A fuelbreak of the same dimensions will be established along the south side of the existing Saddle Road. It will be maintained annually. The fuelbreak will not be established within Waikii ranch property. The fuelbreak will be monitored annually and maintained as necessary to remain within specifications. The existing Saddle Road will serve as the firebreak.

b. Fuels Modification.

(1) Grasses are the primary fuel related concern as their spread and accumulation increase ignition potential and provide contiguous fine fuel beds. Implementation of road/firebreak improvement and development recommendations will serve to reduce flashy fuels along high ignition risk roads and breakup contiguous fuel beds.

(2) Six fuel management corridors will be established and maintained providing areas through which fire will not carry. These corridors will be aligned so as to provide several distinct areas of PTA within which fire may be contained. Each corridor will be approximately 100-300m wide, though terrain, safety concerns, or protected resources may constrain the width in some areas. Fuel specifications within the corridor require that canopy cover not exceed 20%. This will be determined via a scientifically accepted method of ocular estimation.

(3) All of these corridors are located in locales with little or no existing fuel. They will be monitored once every 5 years, beginning in 2005, to determine whether fuels management needs to be initiated. Once management has begun, these corridors will be monitored biannually and treated whenever necessary to remain within specifications.

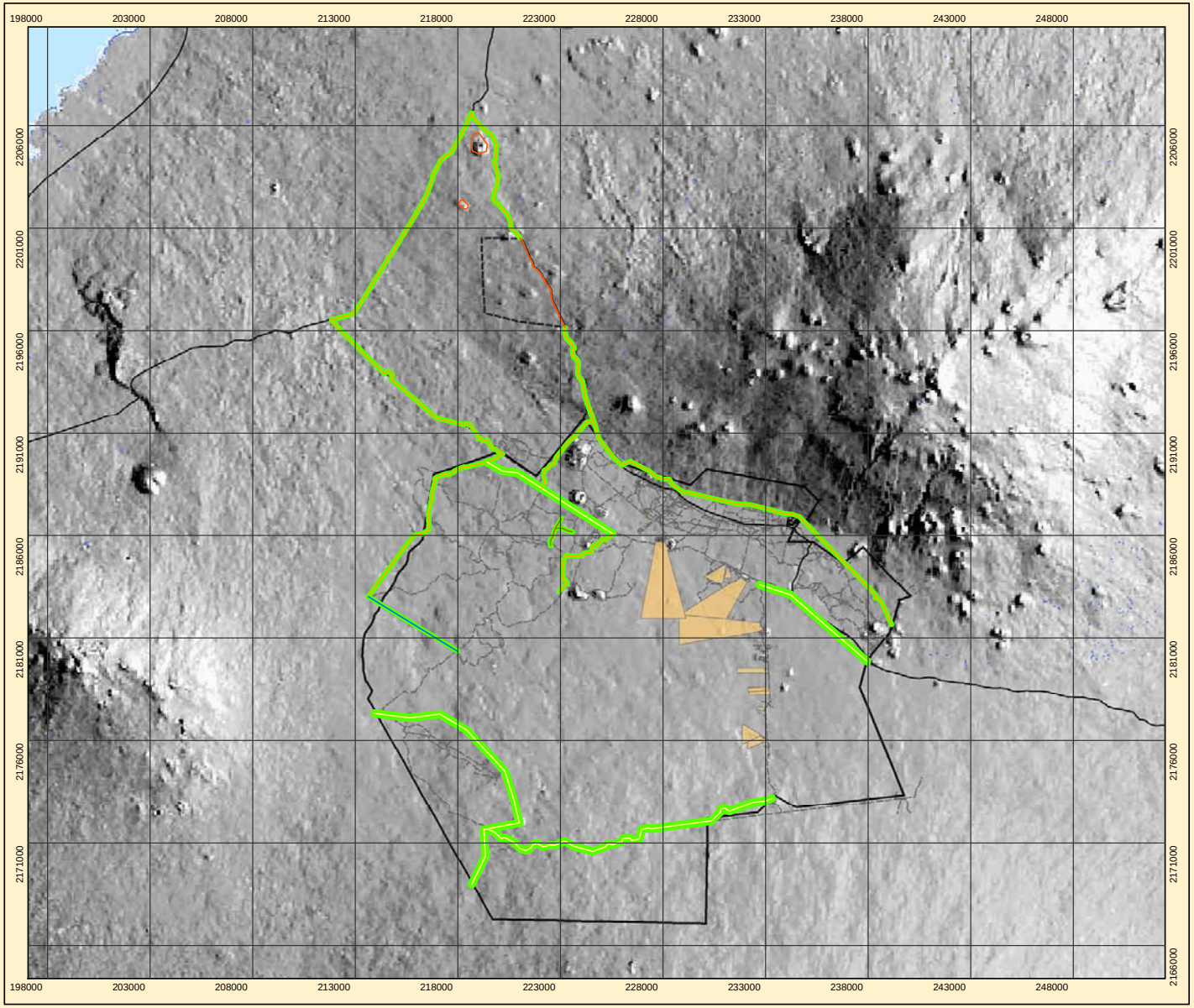
(4) Prescribed burning will also be considered as a future fuels management option. It will be focused on areas dense in exotic grasses, such as far western Kipuka Kalawamauna and the Twin Puus.

(5) Grazing will be considered as an option to control fuels within fuelbreaks. It will also be considered in the event to control fuels throughout the Keamuku Parcel, should that land be acquired by USARHAW.

7.6.6 Project Budget FY 03 to 05*

PROJ/FEWR NO.	PROJECT TITLE	EST COST (x $1000)	FUNDED BY	FY
NA010942J	Rpr/Main PTA West Firebreak (Phase I)	**70**	ITAM	O3
TA100013J	Construct New PTA West Firebreak (Phase II)	**500**	DPW ENV	O4
TA100023J	Construct New PTA North Fuelbreak (Phase III)	**575**	DPW ENV	O4
TA100033J	Construct 3 New PTA Dip Tanks	**325**	DPW ENV	O4
TA100043J	PTA Fuel Management Corridors/Vegetation Control	**110**	DPW ENV	O4
TA100053J	Grazing/Bio-Control Pilot Study at PTA/MMR	**90**	DPW ENV	O4
TA100063J	Install New RAWS Unit Keamuku	**18**	DPW ENV	O5
	Total	**1438**		

*See Annex I for the sustainment budget



Pohakuloa Training Area
Firebreaks and Fuels Management

Figure 14

Legend

Firebreaks
- Firebreak
- Fuelbreak/Firebreak
- Understory Fuelbreak
- Fuel Management Corridor
- Fire Access Road/Fuel Management

Herbicides

Installation Boundary
Keamuku Parcel

Ranges

Surface Water Body

Roads
- Primary
- Secondary
- Tertiary
- Unimproved

N

1:200,000

0 2,500 5,000 Meters

0 2.5 5 Miles

Data Source: Center for Environmental Management of Military Lands 2003
USARHAW IFSO

Table 7.6.2
Federally Listed Endangered and Threatened Species
At Pohakuloa Training Area*

Status	Hawaiian / Common Name	Scientific Name
PLANTS:		
Endangered	Fragile fern	*Asplenium fragile* var. *insulare*
Endangered	Honohono, Hawaiian Mint	*Haplostachys haplostachya*
Endangered	Kio`ele, leather leaf sweet ear	*Hedyotis coriacea*
Endangered	Aupaka	*Isodendrion hosakae*
Endangered	Nehe	*Lipochaeta venosa*
Endangered	Mal'aloa, spotted nettle brush	*Neraudia ovata*
Endangered	Po`e, ihi, ihi makole	*Portulaca sclerocarpa*
Threatened	Hawaiian catchfly	*Silene hawaiiensis*
Endangered	Lanceleaf catchfly	*Silene lanceolata*
Endangered	Popolo, popolo ku mai	*Solanum incompletum*
Endangered	Hawaiian parsley	*Spermolepis hawaiiensis*
Endangered	Creeping mint	*Stenogyne angustifolia*
Endangered	None	*Tetramolopium arenarium ssp. arenarium*
Endangered	Cowpea, Oahu vigna	*Vigna o-wahuensis*
Endangered	A'e, Hawaiian yellow wood	*Zanthoxylum hawaiiensis*
ANIMALS:		
Endangered	Hawaiian Goose, nene	*Branta sandvicencis*
Endangered	Hawaiian Hawk, `io	*Buteo solitarius*
Endangered	`Akiapola`au, honeycreeper	*Hemignathus munroi*
Endangered	Hawaiian hoary bat, 'ope'ape'a	*Lasiurus cinereus semotus*
Endangered	Palila, pooppale, ou-po-opapale	*Loxioides bailleui*
Endangered	Ua'u, Hawaiian Dark-Rumped Petrel	*Pterodroma phaeopygia sandwichensis*

*According to Programmatic Biological Assessment for Transformation of the 2nd Brigade 25th Infantry Division (Light) U.S. Army, Island of Hawaii. April 2003.

7.7. SCHOFIELD BARRACKS EAST RANGE (SBER)

7.7.1.General Description.

a. Location and Size. East Range is located in the central portion of Oahu, 3 miles north of Mililani and adjacent to the southern boundary of the Kawailoa Training Area. It is bounded on the west by Wheeler Army Airfield. The installation consists of 2,086 cede hectares (5,154 acres).

b. Military Land Use. The western half of the training area is suitable for limited battalion and company level infantry ARTEP missions, fixed and rotary wing parachute drop operations. Terrain restrictions permit only squad level training in the eastern portion. East Range is the site of the Light Infantry Training Command (LITC). SBER provides training grounds for the infantry division stationed at the post and for the tactical field exercises of other units of the U.S. Army and the U.S. Marine Corps.

c. Training Capabilities. East Range is valuable for rappelling, jungle survival, and patrolling operations. Several open areas allow for Air Assault and Airborne operations. Use of blank ammunition, noise simulators, and limited use of pyrotechnics are permitted throughout the training area except near the training area boundary adjacent to the town of Wahiawa. No live-fire exercises are conducted at SBER.

d. Climate. Much of the following climate data comes from Schofield Barracks Military Reservation (SBMR).

(1) Rainfall. The annual average precipitation recorded at the Koolau Dam weather station, is 314cm (123.5 inches). Rainfall is closely related to elevation, so other areas of East Range can be expected to vary considerably from this measurement.

(2) Temperature. The annual average temperatures at SBMR range from 20.5° C (69° F) in January and February to 25° C (77.0° F) in August.

(3) Relative Humidity. Average RH from July 1999 to July 2002 measured by the SBER RAWS was 81%. Over the same period, RH ranged from a monthly average low of 76% in June to a high of 94% in April.

(4) Wind. Prevailing winds at SBMR are northeasterly trade winds from 4 to 12 mph in the warmer summer months. Lighter southeasterly winds prevail in winter months.

e. Topography. SBER extends from the central portion of Schofield Barracks eastward towards the crest line of the Koolau Mountains. Steep valleys incise the slopes of the Koolau volcanic range, which reach an elevation of approximately 971m (2,400 ft). The deeply dissected uplands of the leeward slopes make up the eastern portion of SBER. This sector of the installation, used primarily as a tactical training area for combat units, is typically rugged with steep terrain and dense vegetation. The western half of SBER contains several gently sloping grass, brush, and tree-covered areas separated by deep, steeply sloped watercourses.

7.7.2. Vegetation Fuels Classification.

The wildland fire fuel types found at DMR have been categorized into eight classes (Figure 15 and Table 7.7.1). These classes were derived from the National Forest Fire Laboratory (NFFL) fuel behavior models as defined by Anderson (1982). For a full description of Oahu fuel types and their derivation see Section 3.5.

Table 7.7.1
Fuel Types at SBER

Fuel Type	*Fuel Model*	*Vegetation Classifications Included (Genus only)*
Short Alien Grassland	NFFL 2	*Andropogon*
Tall Alien Grassland	Guinea Grass Custom	*Leucaena/Panicum, Melinis/Panicum, Panicum*
Eucalyptus Forest	NFFL 10	*Eucalyptus, Melaleuca*
Ironwood Forest	NFFL 9	*Casuarina*
Mixed Forest	NFFL 8	*Metrosideros/Acacia koa/Dicranopteris*
Christmas Berry Shrublands	NFFL 5	*Schinus*
Kukui Forest	Kukui Custom	*Aleurites*
Developed/Denuded	None	*Agriculture, Urban Development, Bog, Open Water, Roads*

7.7.3. Fire History for SBER. In the period 1994 to 1998 and 2000 to 2002, a total of 14 fires were reported at SBER. These ranged in size from hundredths of a hectare to 4 hectares and totaled 10 hectares (23 acres). The most common cause was pyrotechnics of various varieties. Not enough data is available for a full analysis, but there were no other apparent trends.

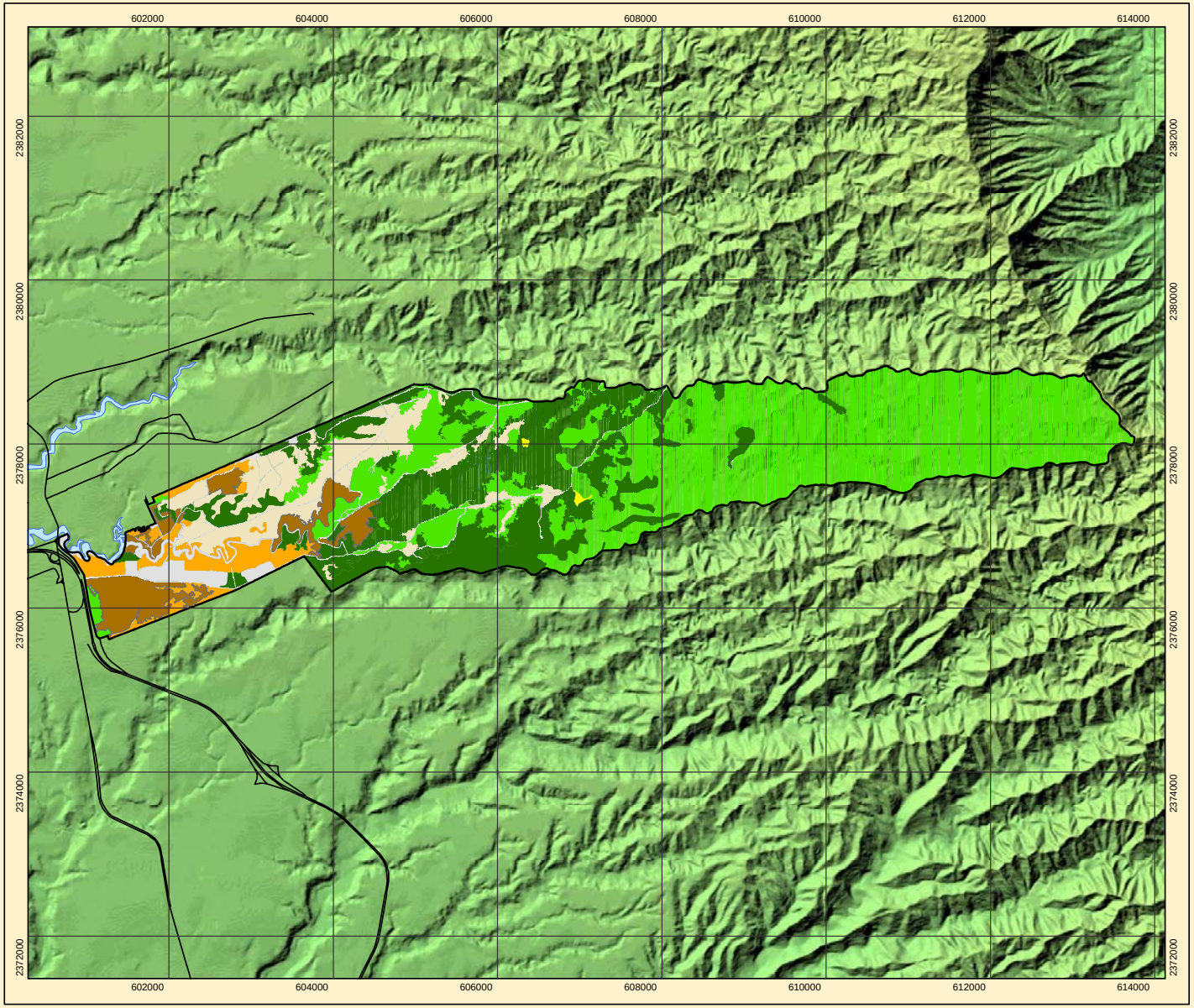
7.7.4 Resource Protection.

a. Biological Sensitive Areas (BSA).

(1) BSAs have been delineated at East Range to assist in setting resource management priorities (See Figure SBER-2 in the SBER SOP, Appendix 1). BSAs depict areas with rare and/or endangered species. Training limitations are imposed on BSA-1 and BSA-2 areas, or those with the highest native natural resource value.

(2) One BSA-1, one BSA-2, and one BSA-3 have been identified at SBER. All three of these occur in ER-13, with the BSA-1 and 2 areas limited to the extreme eastern end of the installation1.

(This Page Intentionally Left Blank)



Schofield Barracks East Range Fuels

Figure 15

Legend

Fuels

- Developed/Denuded
- Eucalyptus
- Ironwood Forest
- Kukui Forest
- Mixed Forest
- Short Alien Grassland
- Tall Alien Grassland

- Installation Boundary
- Surface Water Body
- Primary Roads

N

1:50,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003
IKONOS 4 meter Multispectral Imagery

b. Protected Species.

(1) The USFWS has identified several threatened species that inhabit the area in and around the SBER. Table 7.7.3 lists these federally listed endangered species and their status.

(2) While there is very little maneuver training that takes place in the higher elevations of East Range where threatened species tend to occur, low-level helicopter training may disturb birds or adversely affect the endangered Oahu Tree Snail.

c. Cultural Resources.

(1) There are twelve cultural sites located within SBER. The majority of these sites are comprised of historic military features. These include numerous communication tunnels. Surveys of archaeological resources will continue to be conducted to identify areas of archaeological importance.

(2) Certain areas within SBER have undergone extensive ground disturbing activity. Assessments of the presence or absence of potential archaeological resources will be accomplished on a case-by-case basis to identify subsurface remains.

d. Wildfire Prevention Analysis

Two wildfire areas have been designated based on the location of the most commonly used training areas, and existing roads. Each area was assigned an ignition potential, hazard, and value based upon the best currently available information. The resulting Pre-Suppression Priority map (Figure 16) shows that the lower elevation areas of SBER are at highest risk.

Unit A - Western SBER
- Ignition - High — Significant military activity, no live-fire
- Hazard - High — Areas of heavy, flammable fuels, compartmentalized by roads
- Value - Low — Two listed species on edge of installation

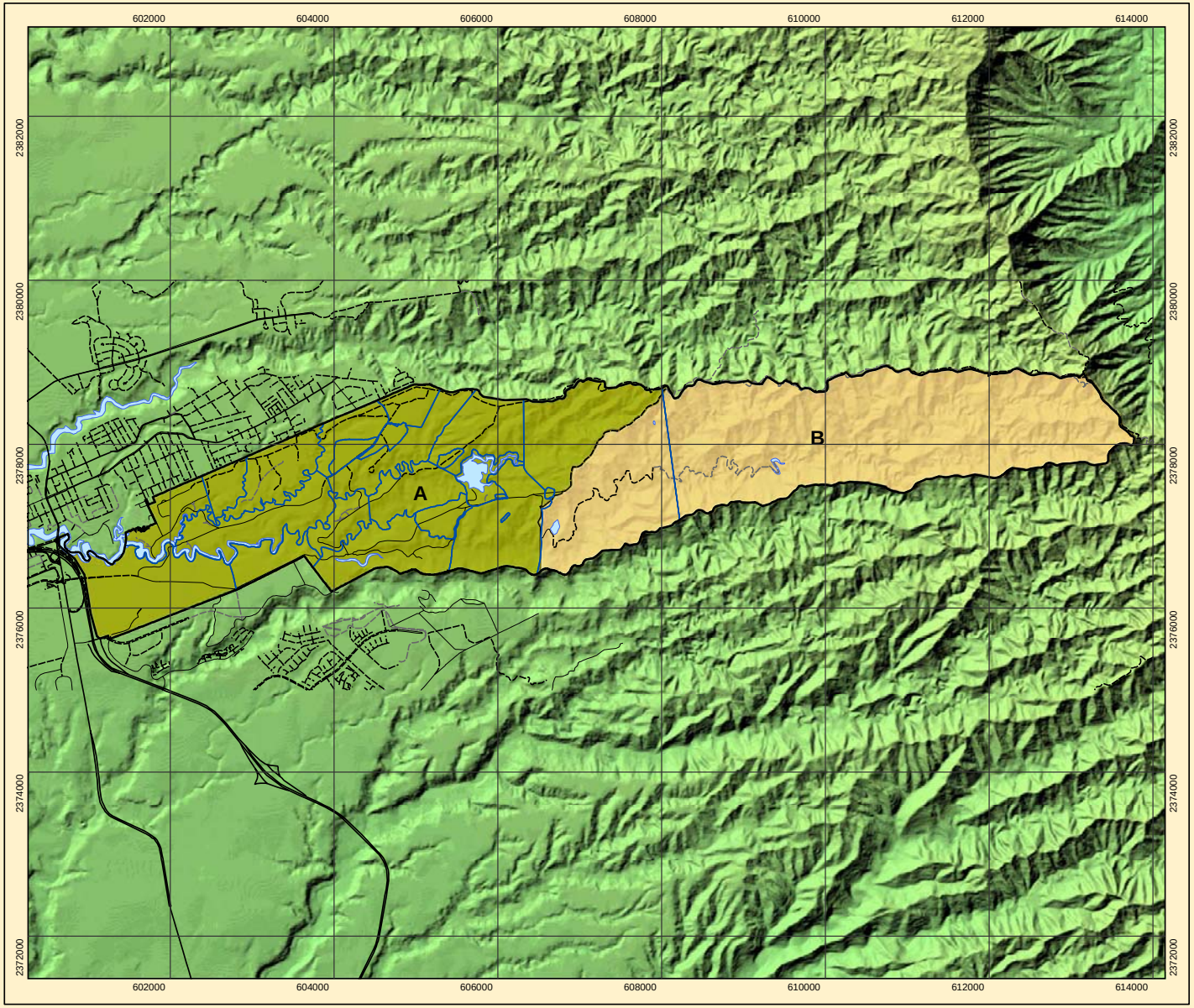
Unit B - Eastern SBER
- Ignition - Low — Little military training, rarely dry enough to support fire
- Hazard - Low — Very little high flammability fuels, high fuel moisture, high decomposition rate
- Value - High — Many federally listed species

(2) By assigning values of 0, 1, and 2 to the low, moderate, and high designations respectively, and adding the values for ignition potential, hazard, and value, a priority level for each area has been determined.

Table 7.7.2
SBER Pre-Suppression Priority

Map Label	*Location*	*Pre-Suppression Priority*
Unit A	Western SBER	4
Unit B	Eastern SBER	2

(This Page Intentionally Left Blank)



Schofield Barracks East Range
Pre-Suppression Priority

Figure 16

Legend

Pre-Suppression Priority

- None
- Low
- Moderate
- High
- Very High

- Installation Boundary
- Training Areas

- Surface Water Body

Roads

- Primary
- Secondary
- Tertiary
- Unimproved

N

1:50,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003

7.7.5. Fire Protection.

a. Firebreak System. There are no existing firebreaks at SBER, though there are a number of existing roads that will serve as fire control lines during fire suppression. They will not be kept at firebreak standards and will only be maintained to the extent necessary for vehicle access.

b. Fuels Modification. Fuel modifications by mechanical crushing, chemical herbicide, and prescribed burning techniques (where applicable) shall be utilized whenever possible and necessary. Where it is not possible to crush and/or prescribed burn, selective clearing and removal with hand labor will be considered. No fuels management is planned at this time.

7.7.6 Project Budget FY 03 to 05*

PROJ/FEWR NO.	PROJECT TITLE	EST COST (x $1000)	FUNDED BY	FY
TA100163J	Fire Access Road Maintenance SBER	**25**	DPW TCCC	O4
TA100173J	Fuel Modification/Vegetation Control SBER	**15**	DPW ENV	O4
	Total	**40**		

*See Annex I for the sustainment budget

Table 7.7.3
Federally Listed Endangered and Threatened Species
At Schofield Barracks East Range*

Status	Hawaiian / Common Name	Scientific Name
PLANTS:		
Endangered	Akoko, koko, kokomalei	*Chamaesyce rockii*
Endangered	haha, ‘ohawai	*Cyanea koolauensis*
Endangered	Ha`iwale, kanawao, ke’oke’o	*Cyrtandra subumbellata*
Endangered	None	*Cyrtandra viridiflora*
Endangered	Nanu, nau	*Gardenia mannii*
Endangered	None	*Hesperomannia arborescens*
Threatened	Aupaka	*Isodendrion longifolium*
Endangered	‘Oha, haha, ‘oha wai	*Lobelia gaudichaudii ssp. Koolauensis*
Endangered	Wawae’iole	*Phelgmariarus nutans (Lycopodium nutans)*
Endangered	None	*Phyllostegia hirsuta*
Endangered	None	*Pteris lidgatei*
Endangered	None	*Sanicula purpurea*
Endangered	`Ohe`ohe	*Tetraplasandra gymnocarpa*
Endangered	None	*Viola oahusensis*
ANIMALS:		
Endangered	Pupu kanioe, pupu kuahiwi, kahuli	*Achatinella byronii*
Endangered	Pupu kanioe, pupu kuahiwi, kahuli	*Achatinella leucorraphe*

*According to Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.

7.8. SCHOFIELD BARRACKS MILITARY RESERVATION (SBMR)

7.8.1. General Description.

a. Location and Size. Schofield Barracks Military Reservation is located in central Oahu, west of the town of Wahiawa (pop. 18,000). SBMR extends from the Kamehameha Highway to the Waianae Mountain Range. SBMR is comprised of approximately 3587 hectares (8,863 acres), of which 1473 (3,640 acres) are ceded and 357 (882 acres) are fee simple.

b. Military Land Use. Schofield Barracks is the primary range complex for individual weapons qualification with limited light maneuver training areas. Lands used for maneuvers at Schofield Barracks Military Reservation (SBMR) include the cantonment area, maneuver training areas, ranges, and impact areas. Training and live-fire impact areas are situated west of the cantonment area.

c. Training Capabilities. The SBMR master plan designates two maneuver areas comprising 500 hectares (1,235 acres) as able to support maneuver training on the South Range, with an additional 609 hectares (1,506 acres) to support range and indirect fire activities, and a 1,125 hectares (2,780 acre) impact area. Small arms, machine gun, mortar, grenade, antitank, and limited short-range indirect fire artillery training are conducted in the firing ranges. The live-fire training facilities at SBMR are used year-round

d. Climate.

(1) Rainfall. The average rainfall varies with elevation and exposure; the averages inland at higher elevations of SBMR are considered representative of the island averages and usually exceed 127cm (50 in) annually, while the overall average for this subinstallation is 111cm (43.75 in). The spring/summer (April-October) monthly average is 4 to 9.6cm (1.63 to 3.78 in), and for fall/winter (November-March) months the range is 10.5 to 15.8cm (4.14 to 6.21 inches).

(2) Temperature. The annual average temperatures at Schofield Barracks Military Reservation range from 20.6° C (69° F) in January and February to 25° C (77.0° F) in August.

(3) Relative Humidity. Average RH from July 1999 to July 2002 measured by the SBMR RAWS was 81%. Over the same period, RH ranged from an average low of 75% in June to a high of 86% in December.

(4) Wind. Prevailing winds are northeasterly trade winds from 4 to 12 mph in the warmer summer months, and lighter southeasterly winds prevail in winter months.

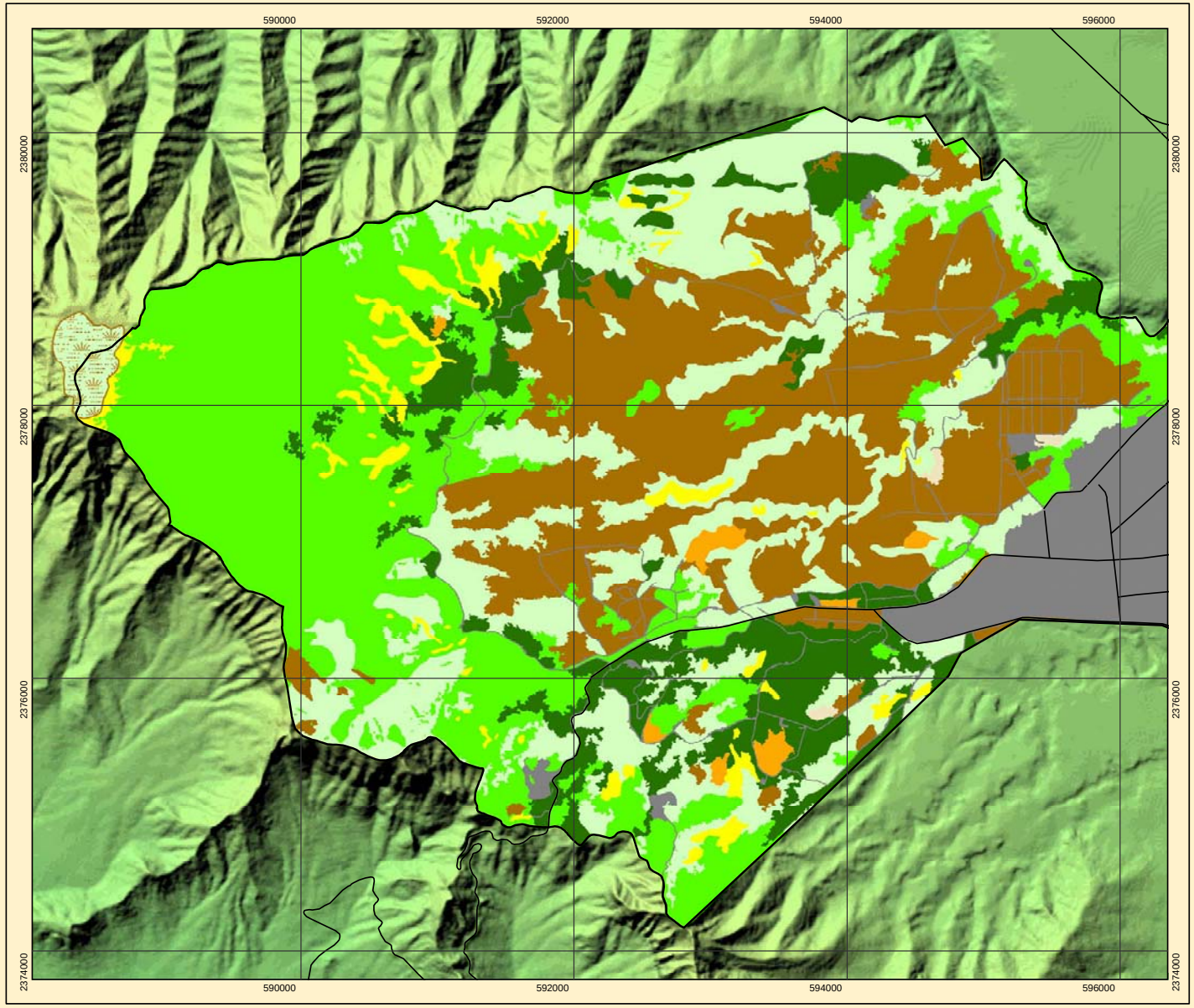
e. Topography. The elevation at the SBMR ranges from 267m (660 ft) in the cantonment area to >1,214m (3,000 ft) in the Waianae Range (USACE and Nakata Planning Group 2000). Slopes of the mountains surrounding the impact area often greater than 20%.

7.8.2.Vegetation Fuels Classification.

The wildland fire fuel types found at SBMR have been categorized into eight classes (Figure 17 and Table 7.8.1). These classes were derived from the National Forest Fire Laboratory (NFFL) fuel behavior models as defined by Anderson (1982). For a full description of Oahu fuel types and their derivation see Section 3.5.

Table 7.8.1
Fuel Types at SBMR

Fuel Type	*Fuel Model*	*Vegetation Classifications Included (Genus only)*
Short Alien Grassland	NFFL 2	*Andropogon*
Tall Alien Grassland	Guinea Grass Custom	*Leucaena/Panicum, Melinis/Panicum, Panicum*
Eucalyptus Forest	NFFL 10	*Eucalyptus, Melaleuca*
Ironwood Forest	NFFL 9	*Casuarina*
Mixed Forest	NFFL 8	*Metrosideros/Acacia koa/Dicranopteris*
Christmas Berry Shrublands	NFFL 5	*Schinus*
Kukui Forest	Kukui Custom	*Aleurites*
Developed/Denuded	None	*Agriculture, Urban Development, Bog, Open Water, Roads*



Schofield Barracks Military Reservation
Fuels

Figure 17

Legend

Fuels

- Christmas Berry Shrublands
- Developed/Denuded
- Eucalyptus
- Ironwood Forest
- Kukui Forest
- Mixed Forest
- Short Alien Grassland
- Tall Alien Grassland

Installation Boundary

Bog

Primary Roads

N

1:30,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003
IKONOS 4 meter Multispectral Imagery

7.8.3 Fire History for SBMR.

a. A fire history was compiled for Schofield Barracks to the extent possible utilizing fire records provided by the U.S. Army Hawaii (USARHAW) Range Division and the Federal Fire Department (FFD) (see Reference 7.8.1). There were frequent gaps in important information, particularly in the acreage burned and the ignition source.

b. Fire at Schofield Barracks has been frequent in the past decade due in large part to the installation's extensive use. Additionally, most types of ammunition, including highly fire prone munitions such as white phosphorous and tracers, are authorized for use. Few fires have burned outside of the firebreak road indicating that it is a substantial barrier to the spread of fire.

c. Significant points from the fire history are summarized below:

(1) The total number of fires per month illustrates that the end of the summer requires the greatest fire management vigilance, though there is also a fairly high incidence in March, April, and May.

(2) Most fires were ignited between 1100 and 1500.

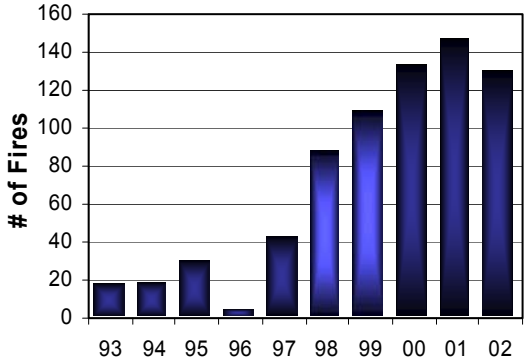
(3) Median fire size is 0.2 hectares (0.5 acres). Only a fraction of the fires that recorded acreage were larger than 10 acres and the largest fire on record was 121 hectares (300 acres). However, the paucity of large fire records is due at least in part to incomplete record keeping.

(4) The greatest number of fires have been ignited at MF-2, in the impact area, and at KR-5. These three locations were responsible for almost half of all fires.

(5) The most significant cause of ignitions at Schofield Barracks has been tracers, which account for just over 50% of all recorded fires.

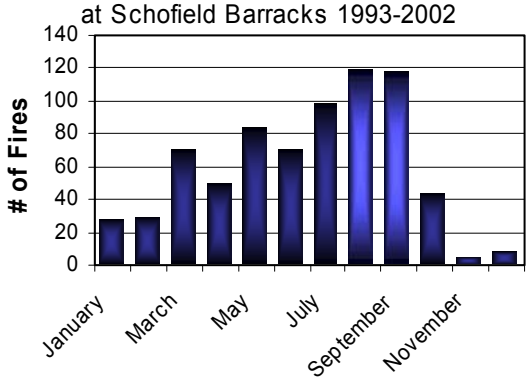
Reference 7.8.1
SBMR Fire History

Figure 1
Number of Fires per Year
at Schofield Barracks 1993-2002



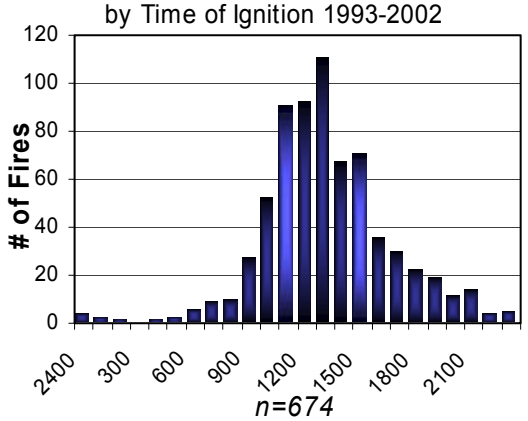
n=712

Figure 2
Number of Fires per Month
at Schofield Barracks 1993-2002



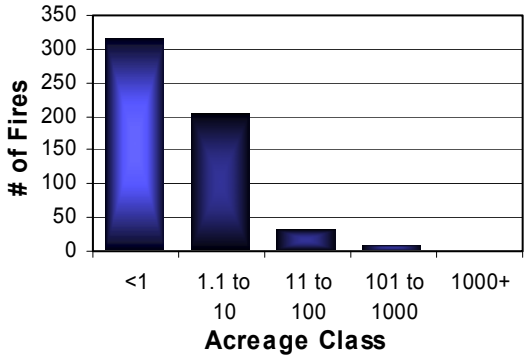
n=712

Figure 3
Number of Fires at Schofield Barracks
by Time of Ignition 1993-2002



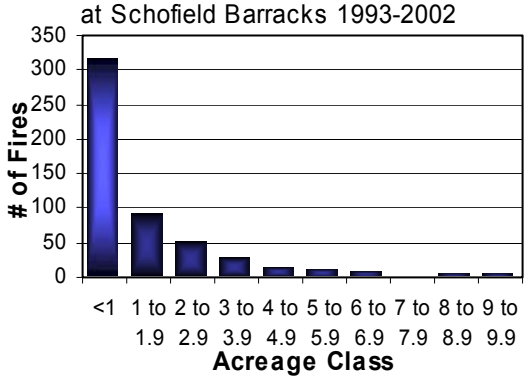
n=674

Figure 4
Number of Fires by Acreage Class
at Schofield Barracks 1993-2002



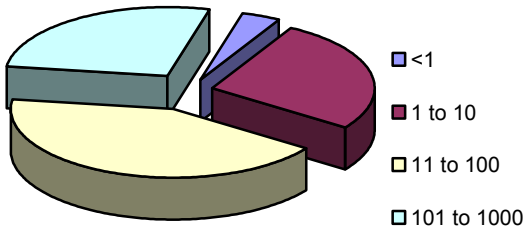
n=551

Figure 5
Number of Fires <10 Acres
at Schofield Barracks 1993-2002

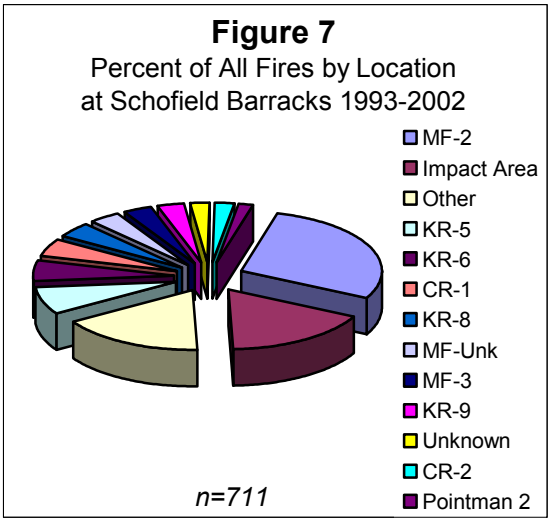


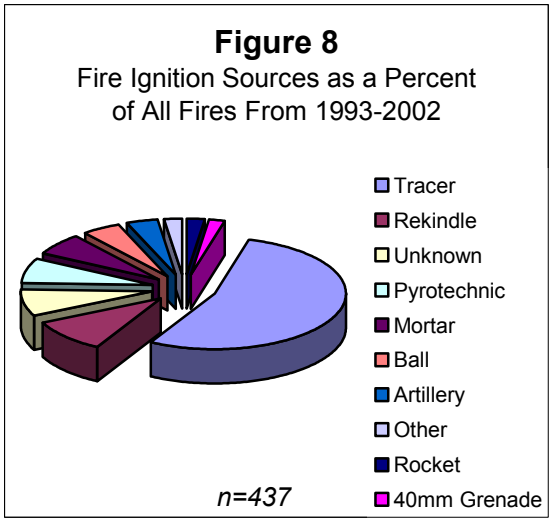
n=515

Figure 6
Percent of Total Area Burned
1993-2002 by Fire Size Class
at Schofield Barracks



n=57





7.8.4 Resource Protection.

a. Biological Sensitive Areas (BSA). There are six natural resource management units within SBMR: North Haleauau Management Unit, Mt. Kaala Management Unit, Banana Gulch Management Unit, North Mohiakea Management Unit, South Mohiakea Management Unit, and Puu Hapapa Management Unit (see Figure SBMR-2 in the SBMR SOP, Appendix 1). There are also seven Biologically Significant Areas designated at SBMR, three BSA-1, three BSA-2, and one BSA-31, all of which are located on the ridges surrounding the impact area.

b. Protected Species. Twenty-two federally listed plant species have been documented at SBMR[1]. Three federally listed animal species have been documented at SBMR (Table 7.8.3). Nearly all of these species occur outside of areas normally used for training.

c. Cultural Resources. SBMR has at least 89 known archeological sites (excluding the cantonment area) or resources including a Heiau or Hawaiian temple, non- or semi-irrigated agricultural sites, irrigated agricultural sites, and habitation sites[2].

[1] Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.
[2] Zulick, L. and D. Cox. 2000. Cultural Resource Management, Army Sub-Installations, U.S. Army Garrison Hawaii (2 vols.). Research Corporation of the University of Hawaii, Army Natural Resource Center, Bldg. 1595, Schofield Barracks, Hawaii.

d. Wildfire Prevention Analysis

(1) Three wildfire areas have been designated based on existing and planned firebreaks and roads. The cantonment area was not included. Each area was assigned an ignition potential, hazard, and value based upon the best currently available information. The resulting Pre-Suppression Priority map shows that the impact area is at highest risk (Figure 18).

Unit A – Impact Area

Ignition	-	High	High frequency of live-fire
Hazard	-	High	Heavy fuel load of *Panicum maximum* and *Melinis minutiflora*
Value	-	Low	No known threatened or endangered species exist in the impact area

Unit B – South Range

Ignition	-	Moderate	Heavy military activity, but much lower frequency of live-fire
Hazard	-	Moderate	Areas of heavy fuels, but roads compartmentalize the area
Value	-	Moderate	Some listed species at higher elevations, mostly degraded habitat

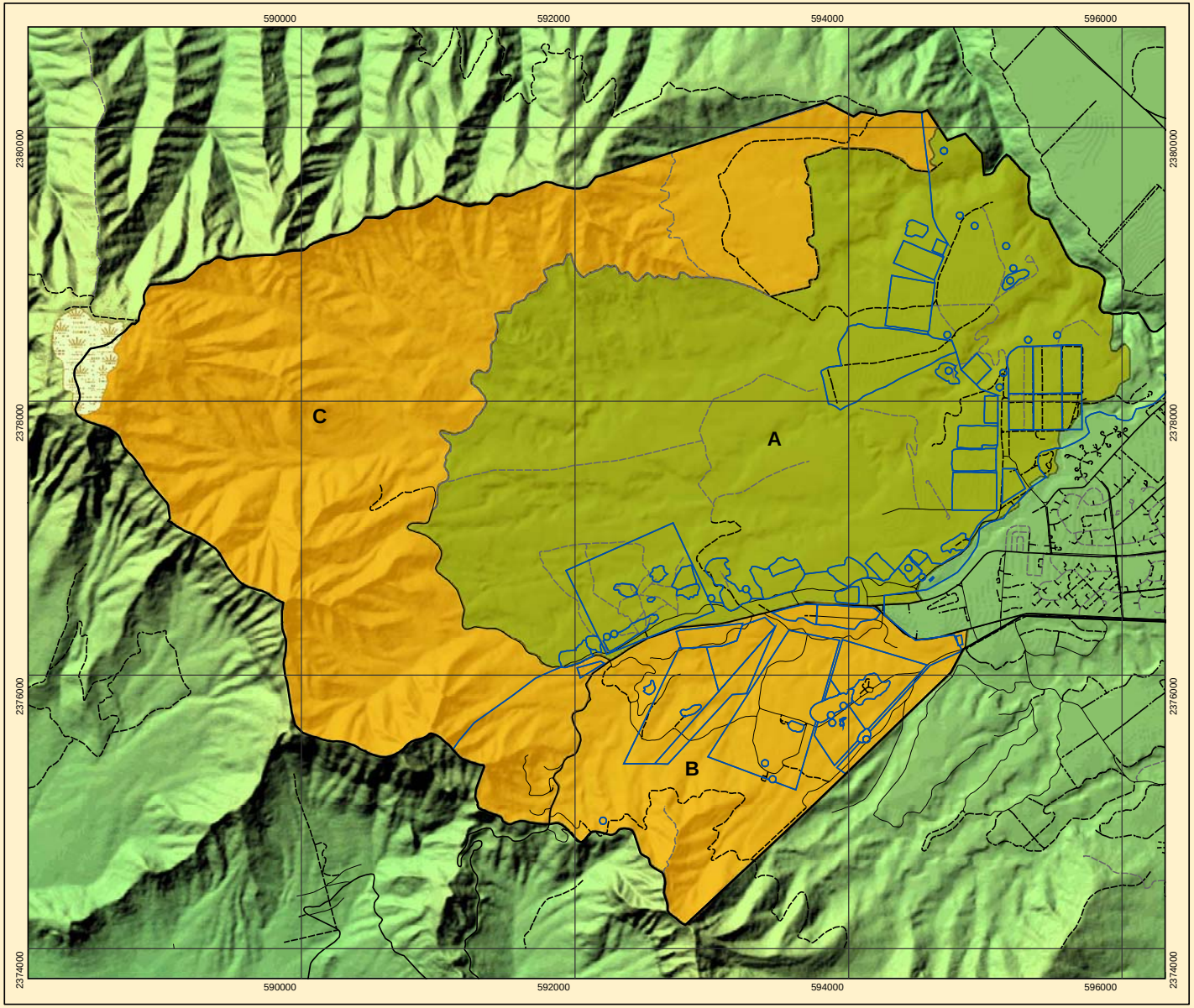
Unit C – Northern and Western SBMR

Ignition	-	Low	No military training, little human activity
Hazard	-	Moderate	Lower elevations contain fire prone fuels, lack of access, firebreaks, or roads make containment difficult
Value	-	High	Many listed species throughout

(2) By assigning values of 0, 1, and 2 to the low, moderate, and high designations respectively, and adding the values for ignition potential, hazard, and value, a priority level for each area has been determined.

Table 7.8.2
SBMR Pre-Suppression Priority

Map Label	*Location*	*Pre-Suppression Priority*
Unit A	Impact Area	4
Unit B	South Range	3
Unit C	Northern & Western SBMR	3



Schofield Barracks Military Reservation
Pre-Suppression Priority

Figure 18

Legend

Pre-Suppression Priority

- None
- Low
- Moderate
- High
- Very High

- Installation Boundary
- Ranges
- Bog

Roads

- Primary
- Secondary
- Tertiary
- Unimproved

N

1:30,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003

7.8.5. Fire Protection.

a. Firebreak System.

(1) There are one existing firebreak and two planned firebreaks at SBMR (Figure 19).

a. The existing break surrounds the impact area and has been in place for many years. Where necessary, it will be upgraded to standard.

b. The first proposed firebreak will surround the MF ranges and connect to firing point 308. Two alternatives are being studied at this time. One or both of them will be constructed depending on feasibility, defensibility, and funding.

c. The second proposed firebreak will contain south range using existing roads. These roads will be improved to firebreak standards

b. Fuels Modification. Several fuels management projects are planned for SBMR

(1) Prescribed burning has been conducted in the past and will continue in the future, primarily within the impact area. A future goal is to compartmentalize the impact area to facilitate this objective. Should the Army Transformation occur, the opportunity to establish control lines within parts of the impact area will present itself when areas are cleared of UXO to install new ranges.

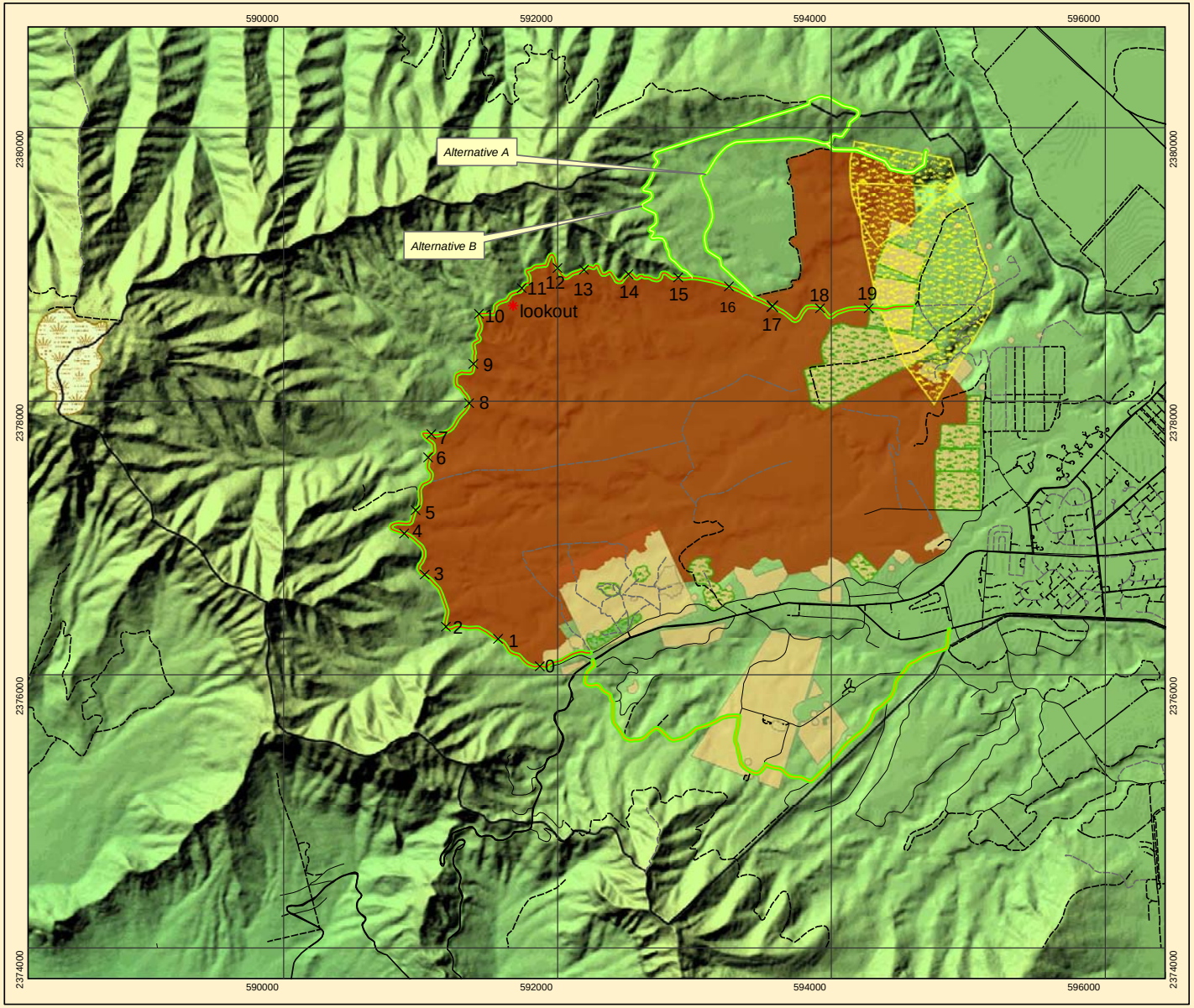
(2) Mechanical, hand, and chemical treatments are in use and planned for all of the firebreaks. The objective of these treatments is to minimize fuels alongside the firebreak and expand its effective width. Herbicides will be used in accordance with all applicable laws and regulations.

7.8.6. Budget

PROJ/FEWR NO.	PROJECT TITLE	EST COST (x $1000)	FUNDED BY	FY
NA010682J	Construct New SB Dip Pond	**60**	DPW TCCC	O3
SBMR 03-01	SBCT Prescribed Burn/Aerial Herbicide	**245**	IFSO	O3
TA100103J	Construct New Firebreak McCarthy Flats	**75**	DPW TCCC	O4
TA100113J	Upgrade SB Firebreak Fixed RAWS Unit	**18**	DPW ENV	O4
	Total	**398**		

*See Annex I for the sustainment budget

(This Page Intentionally Left Blank)



Schofield Barracks Military Reservation
Firebreaks and Fuels Management

Figure 19

Legend

- Existing Firebreak
- Proposed MF Firebreak
- Proposed SR Firebreak
- 1/4 Mile Marker
- Lookout
- Potential Prescribed Burning
- Herbicides

Mowed Areas

- Approximation for SBCT
- Currently Mowed
- Installation Boundary
- Ranges
- Bog

Roads

- Primary
- Secondary
- Tertiary
- Unimproved

N

1:30,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003
USARHAW IFSO

Table 7.8.3
Federally Listed Endangered and Threatened Species
At Schofield Barracks Military Reservation*

Plants:		
Federal Status	**Common Name**	**Scientific Name**
Endangered	None	*Abutilon sandwicense*
Endangered	`Ala `alahua, mahoe	*Alectryon macrococcus* var. *macrococcus*
Endangered	None	*Alsinidendron trinerve*
Endangered	`Oha, haha, `ohawai	*Cyanea acuminata*
Endangered	`Oha, haha, `ohawai	*Cyanea grimesiana spp. obatae*
Endangered	Haha, `ohawai	*Cyanea lanceolata spp. calycina*
Endangered	Haha, `ohawai	*Delissea subcordata*
Endangered	None	*Diellia falcata*
Endangered	Mehamehame	*Flueggea neowawraea*
Endangered	Nanu, na`u	*Gardenia mannii*
Endangered	None	*Hesperomannia arborescens*
Threatened	Aupaka	*Isodendrion longifolium*
Endangered	Kamakahala	*Labordia cyrtandrae*
Endangered	`Anaunau, naunau,kunana	*Lepidium arbuscula*
Endangered	`Oha, haha, `ohawai	*Lobelia oahuensis*
Endangered	None	*Phyllostegia hirsuta*
Endangered	None	*Phyllostegia kaalaensis*
Endangered	None	*Phyllostegia mollis*
Endangered	Ale	*Plantago princeps princeps*
Endangered	None	*Schiedea hookeri*
Endangered	None	*Schiedea kaalae*
Endangered	Olopu, pamakani	*Viola chamissoniana spp. Chamissoniana*

Animals:		
Federal Status	**Common Name**	**Scientific Name**
Endangered	Pupu Kuahiwi, Pupu Kanioe, Kahuli	*Achatinella mustelina*
Endangered	Oahu `Elepaio	*Chasiempis sandwichensis ibidus*
Endangered	`Ope`ape`a, Hawaiian hoary bat	*Lasiurus cinereus semotus*

*According to Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.

7.9. SOUTH RANGE ACQUISITION AREA (SRAA)

7.9.1. General Description.

a. Location and Size. The South Range Acquisition Area is located in the central portion of Oahu, and borders the southern portion of SBMR.

b. Military Land Use. The SRAA is not yet owned by the military, but is a planned acquisition to accommodate the SBCT Transformation to occur sometime in the near future. Training is expected to be limited to a fixed target range to be used for qualification training. Limited maneuver training may also be practiced.

c. Training Capabilities. A qualifying training range (QTR-2) is expected to be constructed to satisfy the Army's need for a range at which to qualify soldiers for marksmanship.

d. Climate. The climate is almost identical to SBMR. The following information is from SBMR.

(1) Rainfall. The average rainfall varies with elevation and exposure; the averages inland at higher elevations of SBMR are considered representative of the island averages and usually exceed 50 in annually, while the overall average for this subinstallation is 43.75 in. The spring/summer (April-October) monthly average is 4.2 to 9.6cm (1.63 to 3.78 in), and for fall/winter (November-March) months the range is 10.5 to 15.8cm (4.14 to 6.21 inches).

(2) Temperature. The annual average temperatures at Schofield Barracks Military Reservation range from 20.6° C (69° F) in January and February to 25° C (77.0° F) in August.

(3) Relative Humidity. Average RH from July 1999 to July 2002 measured by the SBMR RAWS was 81%. Over the same period, RH ranged from an average low of 75% in June to a high of 86% in December.

(4) Wind. Prevailing winds are northeasterly trade winds from 4 to 12 mph in the warmer summer months, and lighter southeasterly winds prevail in winter months.

e. Topography. SRP will sit on fields previously used for pineapple cultivation. These are gently sloping and are broken by gullies of varying depth.

7.9.2. Vegetation Fuels Classification.

The wildland fire fuel types found at SRAA have been categorized into five classes (Figure 20 and Table 7.2.1). These classes were derived from the National Forest Fire Laboratory (NFFL) fuel behavior models as defined by Anderson (1982). For a full description of Oahu fuel types and their derivation see Section 3.5.

Table 7.9.1
Fuel Types at SRAA

Fuel Type	*Fuel Model*	*Vegetation Classifications Included (Genus only)*
Tall Alien Grassland	Guinea Grass Custom	*Leucaena/Panicum, Melinis/Panicum, Panicum*
Eucalyptus Forest	NFFL 10	*Eucalyptus, Melaleuca*
Mixed Forest	NFFL 8	*Metrosideros/Acacia koa/Dicranopteris*
Kukui Forest	Kukui Custom	*Aleurites*
Developed/Denuded	None	*Agriculture, Urban Development, Bog, Open Water, Roads*

7.9.3. Fire History for SRAA. The SRAA is not owned by USARHAW, so no military ignited fires have occurred there. Agricultural burning has been practiced here in the past, but no fire records are available.

7.9.4 Resource Protection.

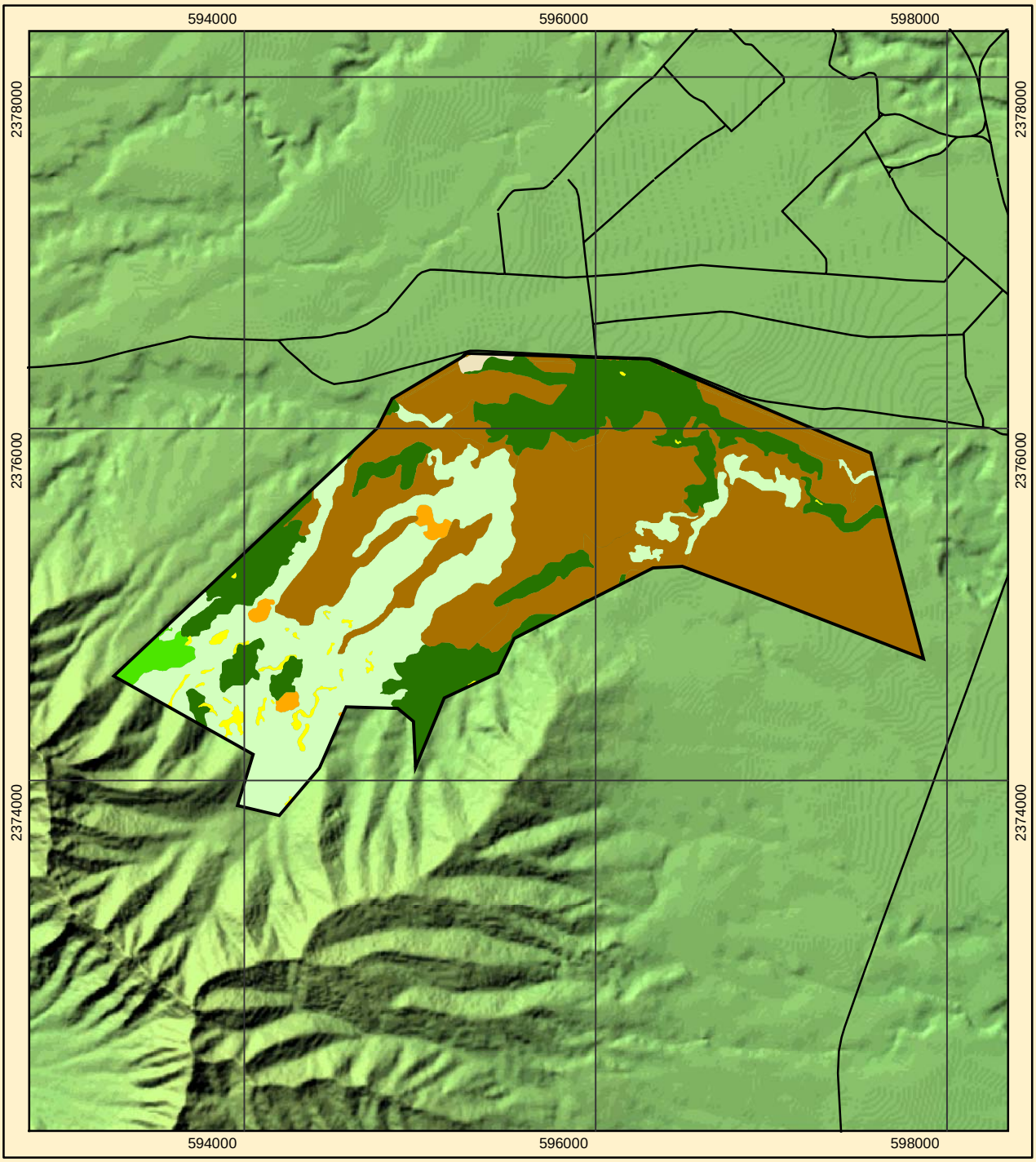
a. Biological Sensitive Areas (BSA). No BSA's have been identified in SRAA

b. Protected Species. According to the Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii, no federally listed species will be affected by military training at SRAA.

c. Cultural Resources. Surveys by Garcia and Associates (GANDA) performed for USARHAW have documented 44 archeological or other sites of significance.

South Range Acquisition Area
Fuels

Figure 20



1:35,000

0 500 1,000 Meters

0 0.5 1 Mile

Legend

Fuels
- Christmas Berry Shrublands
- Developed/Denuded
- Eucalyptus Forest
- Ironwood Forest
- Kukui Forest
- Mixed Forest
- Short Alien Grassland
- Tall Alien Grassland

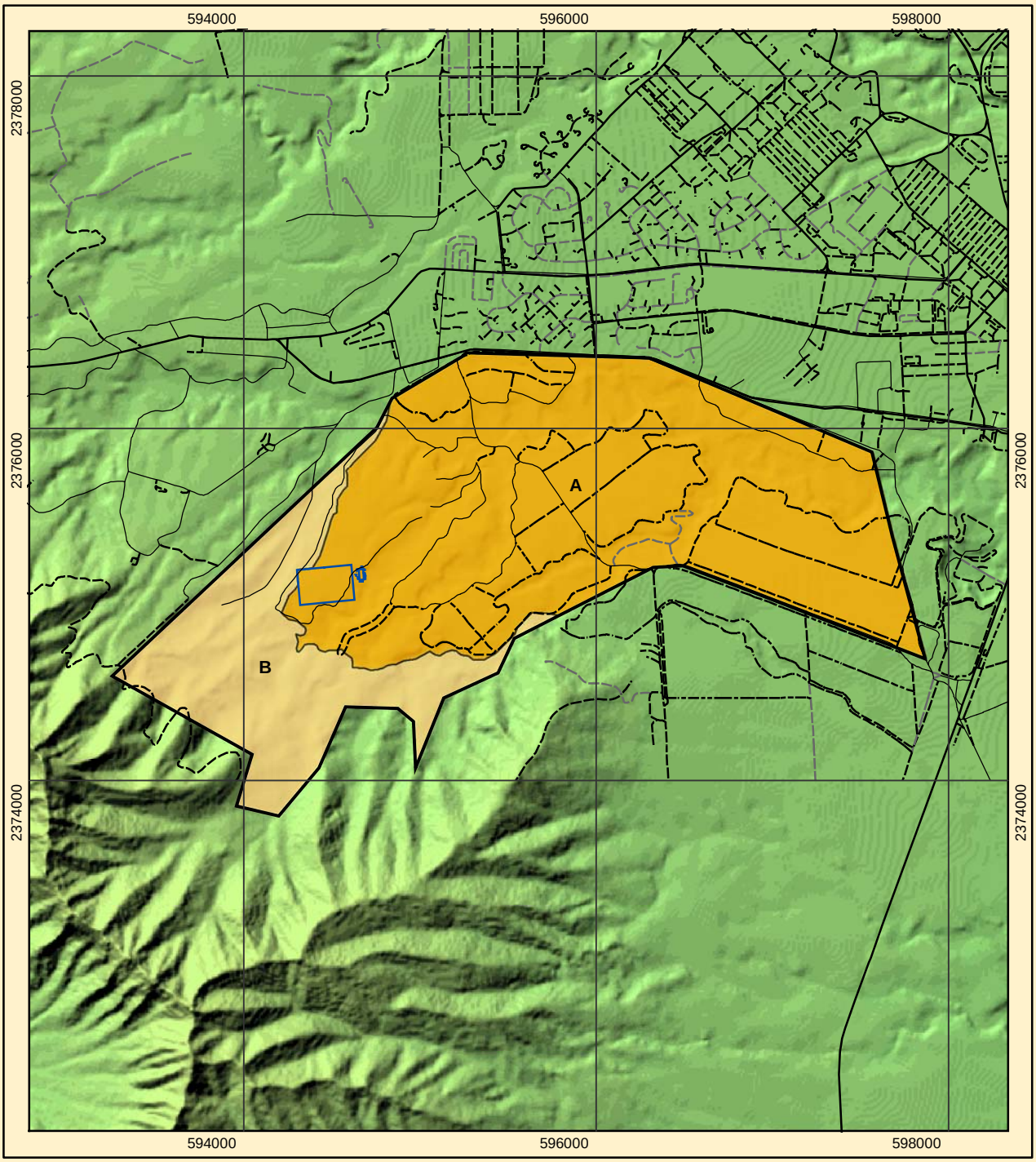
Installation Boundary

Primary Roads

Data Source: Center for Environmental Management of Military Lands 2003
IKONOS 4 meter Multispectral Imagery

South Range Acquisition Area
Pre-Suppression Priority

Figure 21



N

1:35,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003

Legend

Pre-Suppression Priority
- None
- Low
- Moderate
- High
- Very High

- Installation Boundary
- QTR2 Range

Roads
- Primary
- Secondary
- Tertiary
- Unimproved

7.9.5. Fire Protection.

a. Firebreak System. One firebreak is planned for SRAA that will contain all training planned (Figure 22). There are also a number of existing roads that will serve as firebreaks during fire suppression. They will not be kept at firebreak standards and will only be maintained to the extent necessary for vehicle access.

b. Fuels Modification. Fuel modifications by mechanical crushing, chemical herbicide, and prescribed burning techniques (where applicable) shall be utilized whenever possible and necessary. Where it is not possible to crush and/or prescribed burn, selective clearing and removal with hand labor will be considered. It is expected that the firing range and the immediate surrounding area will be mowed regularly, similar to the current fuels management on the CR ranges at SBMR.

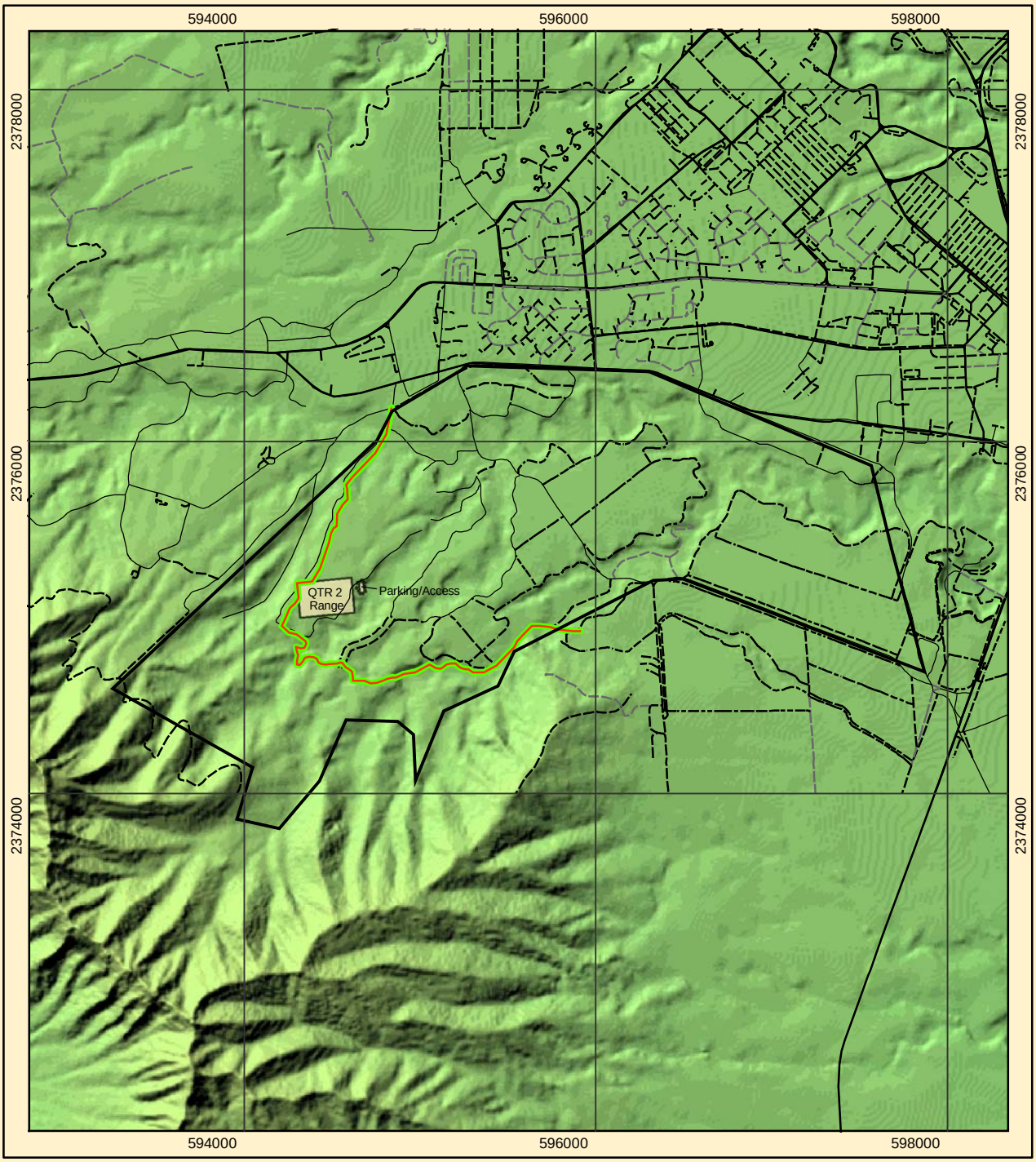
7.9.6 Project Budget FY 03 to 05

PROJ/FEWR NO.	PROJECT TITLE	EST COST (x $1000)	FUNDED BY	FY
TA100123J	Construct New SRAA Firebreak QTR2	**125**	DPW ENV	O5
TA100133J	Construct New Dip Pond South Range	**75**	DPW TCCC	O5
TA100143J	Fuel Modification/Vegetation Control South Range	**25**	DPW ENV	O5
TA100153J	Install New RAWS Unit South Range	**18**	DPW ENV	O4
	Sub Total	**243**		

*See Annex I for the sustainment budget

South Range Acquisition Area
Firebreaks and Fuels Management

Figure 22



N

1:35,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Center for Environmental Management of Military Lands 2003
USARHAW IFSO

Legend

- Proposed Firebreak
- Herbicides
- Installation Boundary
- Ranges

Roads

- Primary
- Secondary
- Tertiary
- Unimproved

Table 7.9.2
Federally Listed Endangered and Threatened Species
At South Range Acquisition Area*

Status	Hawaiian / Common Name	Scientific Name
PLANTS:	**None**	
ANIMALS:	**None**	

*According to Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.

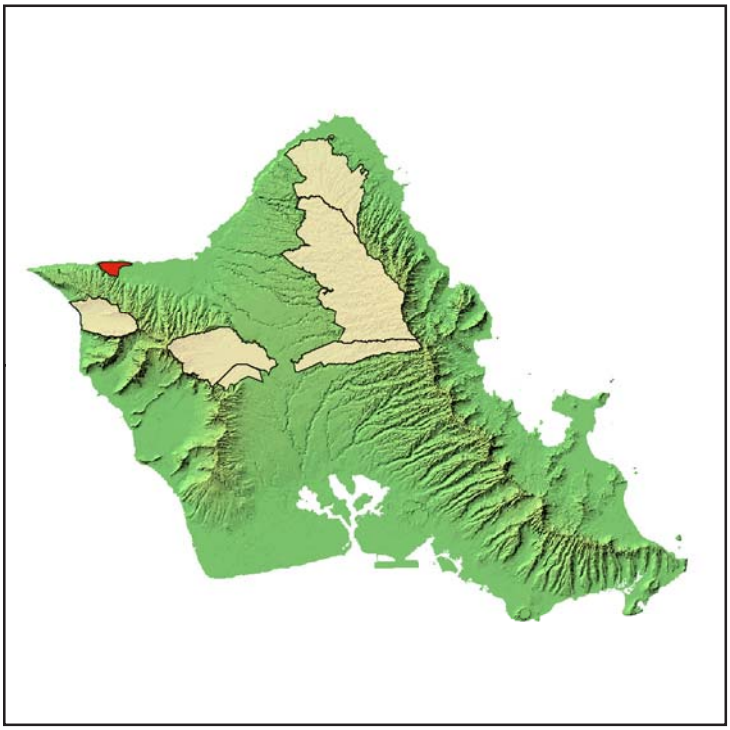
Appendix 1

Wildland Fire

Standing Operating Procedures

DILLINGHAM MILITARY RESERVATION

STANDING OPERATING PROCEDURES



DILLINGHAM MILITARY RESERVATION WILDFIRE SOP

1. GENERAL

1.1. Purpose and Objective.

The purpose of this Standing Operating Procedure (SOP) is to provide specific requirements that delineate the responsibilities of the Army, Federal Fire Department, Range Control personnel, and using training units in the prevention and suppression of wildland fires at Dillingham Training Area (DMR). Its primary objective is to prevent unplanned ignitions through sound preventive measures. It also establishes procedures toward fire control and the protection of natural/cultural resources from wildfires. See Figure DMR-1 for an overview.

1.2. Scope and Applicability.

The provisions outlined in this SOP are applicable to all military training units and personnel assigned to or utilizing DMR. Senior unit commanders, regardless of service or component, whose unit has been allocated the use of DMR, will ensure compliance with this SOP. All officers and noncommissioned officers will familiarize themselves with the contents of this SOP or receive a fire prevention briefing prior to use of the DMR range facilities. It is imperative that awareness on the part of all commanders is maintained and that all necessary persons are instructed in fire prevention and fire suppression. It is the intent of this SOP that all persons are made so aware, and that the instructions and guidance contained herein is employed with a view towards accomplishing training with an absolute minimum of unwanted fires.

1.3. Responsibilities.

a. Installation Commander. The Installation Commander has the overall responsibility for fire prevention and protection requirements and environmental management at DMR.

b. Director of Installation Fire and Safety Office. The Director of Installation Fire and Safety has overall responsibility for the wildland fire management program.

c. Fire Chief, Federal Fire Department (FFD). The installation Fire Chief is responsible for the organization, supervision, and management of all aspects of the fire prevention and protection program in accordance with the provisions of DoDI 6055.6, Fire Protection.

d. Range Officer, G3/DPTM, Range Division Hawaii. The Range Officer has overall responsibility for enforcing the provisions of the Integrated Wildland Fire Management Plan (IWFMP) and other applicable training directives and regulations, including restrictions on or cessation of training activities based on the day's fire danger rating.

e. Range Operations Supervisor, Schofield Barracks. The SB Range Operations Supervisor is responsible to the Installation Commander for ensuring proper fire prevention measures are taken by troops in rear areas; fires, when discovered, are promptly reported; and augmenting the Federal Fire Department in fighting any fires on DMR.

Dillingham Military Reservation
Fire Suppression Resource Locations

Figure DMR - 1

N

1:120,000

0 2,500 5,000 Meters

0 2.5 5 Miles

Data Source: USARHAW IFSO

Legend

- Proposed Firebreak 1
- Proposed Firebreak 2
- Installation Boundary
- Training Areas
- Surface Water Body
- Proposed Remote Automatic Weather Station

Roads

- Primary
- Secondary
- Unimproved
- Military Vehicle Trail

f. Wildland Fire Program Manager, IFSO. The Wildland Fire Program Manager is responsible for the execution of the Army's wildland fire program. Collaborates with other resource managers, FFD and other cooperative fire agencies to ensure that supplies, equipment, training, and qualified personnel are available to meet the goals and objectives of the IWFMP.

g. Unit Commanders and Division Chiefs. Commanders, managers, and supervisors at all levels of the organization are responsible for ensuring unit personnel are familiar with and comply with the provisions of this SOP and applicable regulations, fire prevention restrictions, training activities within biologically sensitive areas, providing qualified personnel to support the wildland fire management program.

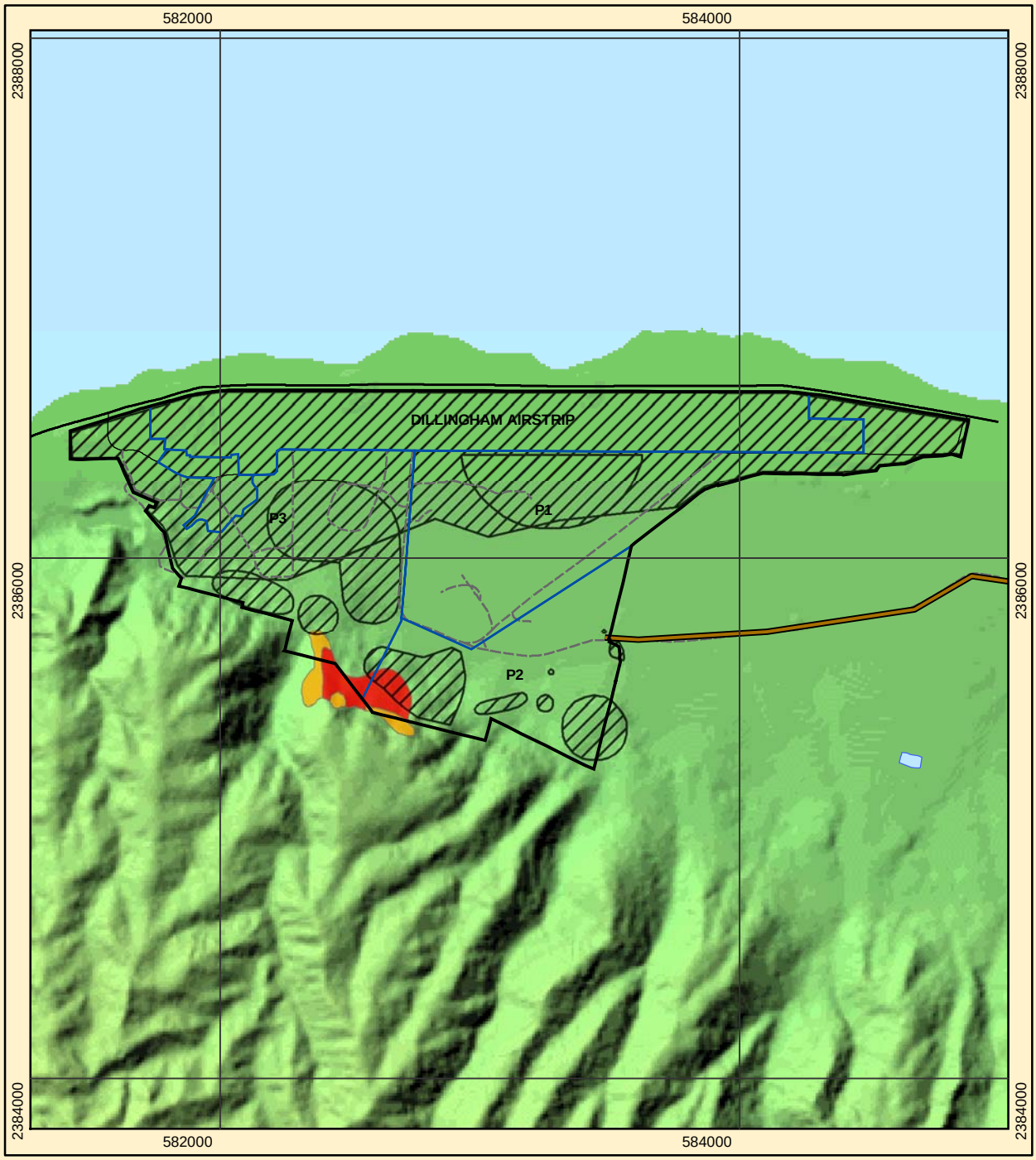
1.4. Environmental Considerations.

a. Wildfires pose significant risks to threatened and endangered species of plants and animals and their native habitat. These habitats are located throughout various areas of the training ranges and adjacent outside the installation's boundary of DMR (Figure DMR-2). Cultural resources to include known archaeological sites are also found within the installation. Significant threats to the archaeological sites at DMR have generally been identified as explosive ordnance detonation, maneuvering activities, unmonitored ground disturbing activities, and vegetation clearance. Fire is also a potential threat to archaeological sites from fire suppression activities.

b. Environmental Stewardship. Applicable environmental laws mandate the protection and conservation of natural/cultural resources. The use of various ammunitions, weapon systems, and pyrotechnics during training exercises increases the risk of wildfire and human or vehicular activity that can destroy native habitat. In the past, live-fire activities on Army training lands have burned large areas of native vegetation and threatened endangered species of plants and animals. The continued use of Army training lands in Hawaii depends upon the Army's ability to reduce the number of fire starts and control fires within the installation boundary.

Dillingham Military Reservation
Protected Resources

Figure DMR - 2



1:24,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.
USAG HI DPW 2003.

Legend

Biological Sensitive Areas
- BSA-1
- BSA-3
- Sensitive Archeological Areas
- Installation Boundary
- Training Areas
- Surface Water Body

Roads
- Primary
- Secondary
- Unimproved
- Military Vehicle Trail

2. FIRE PREVENTION.

One of the primary objectives of this SOP is to integrate fire management actions with military training requirements and range operations. The prevention of fires is the responsibility of every individual training and/or working at DMR. Fire prevention and the ability to control the spread of fires is critical for the continued survival of endangered plants, animals and native ecosystems, and the Army's continued use of the area as a training range. Currently, there are many instance where military operations conflict with the management of these special natural resources. These conflicts often result in reduced training capability as "WILDLAND FIRES STOPS TRAINING". Fire management actions are designed to reduce existing conflicts between necessary military training activities and the conservation of natural and cultural resources found within DMR.

2.1. Education.

a. Soldiers will be briefed prior to training about fire prevention, and cultural and natural resource protection. The fire prevention briefing ensures that important information is provided to using individuals that may start wildfires.

b. Signs will be posted throughout various areas as reminders of prevention and awareness of the Fire Danger Rating System (FDRS).

c. Fire prevention and environmental pocket cards will be issued to users to increase individual's awareness of fire and environmental issues.

2.2. Enforcement.

a. The primary responsibility for enforcement of range directives falls on Range Control.

b. Secondary responsibility rests with the using unit commanders.

c. Failure to follow range protocols will result in termination of scheduled training and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

2.3. Engineering.

a. Two firebreaks are scheduled for construction at DMR (Figure DMR-1).

b. Firebreaks will be constructed to USARHAW standard width (see Section 4.3). The design and construction of the firebreaks will minimize negative effects to the extent feasible.

c. An annual work plan will be coordinated by the Wildland Program Manager through the Range planner, Range Maintenance, ITAM, and DPW.

2.4. Ignition Control.

a. All training will be subject to the fire danger rating system (see Section 3.1 and Enclosure 4 of this SOP).

b. Fuels management as described in Section 7.2.5 of the IWFMP will be implemented in part to reduce the chance of ignition.

3. PRE-SUPPRESSION ACTIONS.

3.1. Fire Danger Rating System.

a. Schofield Barracks Range Control will be responsible for retrieving weather data from the DMR RAWS and archiving it into the "WeatherPro" software program. The BI, as determined by the National Fire Danger Rating System (NFDRS), will be used to rank fire danger based on known ignition sources.

b. The BI's will be monitored every hour, on the hour. Range control will notify the training unit every hour, on the hour, of any training restrictions being imposed as a result of unfavorable fire danger ratings. Additionally, at any time that the BI changes from one category to another, training units will be notified.

c. Live-fire and tracer ammunition is prohibited at DMR. Blank ammunition and limited pyrotechnics are permitted. Range control approval and guidance must be obtained prior to firing all pyrotechnics.

d. Training is allowed outside of the firebreaks, but is be limited to no ignition sources of any kind. Pyrotechnics, blanks, smoking, and cooking/warming fires are not allowed anywhere outside of the second firebreak at any time. Until the second firebreak is completed, this restriction will apply to the first firebreak. Until the first firebreak is completed, this restriction will apply to any area outside of P-1 and the Dillingham airstrip.

e. While training at DMR, units must use caution during training exercises. Soldiers must be aware of and adhere to fire danger-rating restrictions of incendiary ammunition, pyrotechnics, smoking, and other ignition sources (see Enclosure 8). Strict compliance with training restrictions set forth herein will reduce the number of fire starts. The DMR Fire Danger Rating System is as follows:

Flame Length (ft)	Burning Index	Fire Index Color
0-11	0-47.9	Green
11+	48+	Red

f. Only two fire danger categories are necessary at DMR. All munitions approved for use at DMR are authorized under the Green Fire Index. All munitions, as well as smoking, and cooking/warming fires are prohibited under the Red Fire Index. For a full list of restrictions, see Enclosure 8 of this SOP.

g. OIC's in charge of training will allow training to commence only after ascertaining that the training restrictions are in effect and adopting the appropriate fire prevention measures.

h. Because there is currently no RAWS at DMR, the FDRS is based on data from the Makua Range RAWS. The FDRS will be updated when sufficient data from the planned DMR RAWS has been collected to allow analysis.

3.2. Minimum Staffing Requirements.

a. Proper staffing and fire response of the FFD shall be in accordance with DoDI 6055.6, Fire Protection.

b. An auxiliary wildland fire fighting force (Range Control) augments the FFD as first responders during initial attack operations on training ranges. At a minimum, wildland fire operations requires two (2) trained Range Control personnel for each HMMWV response. This requirement is based on the safety and complexity of the fire fighting organization during initial/extended attack operations and FFD response time from Station 15 (Schofield Barracks).

c. The range operations supervisor will arrange work schedules to allow flexibility while ensuring that minimum staffing levels are met to include overtime authorizations. In the event of fire, fire fighting duties take precedence over other work assignments.

d. At DMR there is no requirement for aerial or ground fire fighting resources to be on site during training.

3.3. Training.

a. Policy requires that all Range Control and fire department personnel engaged in suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG). The Army's wildland fire program manager will coordinate with the FFD and Range Control staff to develop a certification-training program.

b. Individuals will not be assigned to duties for which they lack training and/or certified experience. All Range Control and fire department personnel dispatched or assigned to wildfires or prescribed fires will be qualified for the fire position assigned, unless assigned as trainees and under direct supervision of higher qualified personnel at all times.

c. The wildland fire program manager will administer and manage an effective qualification and certification program. He will monitor all employee's wildland fire management development (training and experience) to ensure accurate qualification and certification standards. All personnel engaged in wildland ground fire fighting activities must satisfactorily complete the following suppression skills courses as a minimum: S-110, Basic Fire Suppression Orientation; S-130, Firefighter Training; S-190, Introduction to Fire Behavior; and I-100, Introduction to Incident Command System (ICS).

d. The Army's wildland fire program manager will coordinate with the FFD training officer to develop the annual wildland training schedule. A recurring proficiency program will include quality instruction and evaluation of employee's proficiency level through quarterly training exercises that are monitored by the fire department training officer.

3.4. Fire Equipment and Supplies.

a. If at any time the required fire suppression equipment is not operational, training will be suspended until all equipment is operational. Training will only be conducted when fully trained/certified personnel and functioning equipment is available for fire suppression. This requirement pertains to all types of fire fighting equipment, water resources, and personnel. Emergency contingency plans must be developed by the FFD to ensure that this requirement is met.

b. The Wildland Fire Program Manager will maintain a cache of fire equipment at SBMR in a constant state of readiness. The fire cache will contain a supply of fire hand tools, chainsaws, pumps, forestry hose, foam concentrate, etc., necessary to support fire suppression activities. A satellite fire cache will be kept at DMR that will contain several types of handtools and backpack pumps for units to use in initial attack.

c. The Wildland Fire Program Manager will conduct periodic checks to ensure all resources are in place and will identify and immediately correct any deficiencies. The FFD District Chief shall coordinate with the Army's wildland fire program manager for equipment replacement.

d. Range control shall be responsible to coordinate with the Wildland Fire Program Manager for replacement of equipment.

3.5. Personal Protective Equipment (PPE).

a. It is mandatory that all fire fighting personnel assigned to combat fires at DMR be equipped with proper PPE (see Reference 4.2.2 of the IWFMP) necessary for combating wildfires. Range control personnel will ensure that proper PPE is worn at all times when actively engaged in fire fighting duties. Personal safety and prevention of injuries is the first priority in every fire management activity.

b. PPE for training units will be issued from the SBMR fire cache supplies. The fire cache will be maintained by the wildland fire program manager and shall be equipped to outfit a minimum of one hundred (100) firefighters with appropriate PPE.

3.6. Fire Response Vehicles.

a. One HMMWV equipped with 300-gallon slip-on pump unit (Class A foam capable) shall be assigned for initial attack response to DMR from Schofield Barracks.

b. Range control personnel operating fire response vehicles shall be qualified and licensed to operate emergency vehicles. The Wildland Fire Program Manager shall monitor vehicle qualification and training program for Range Control staff.

c. Personnel will perform daily preventive maintenance inspections of vehicles and pumps to ensure operational readiness. All discrepancies shall be identified and coordinated through appropriate channels for Priority 03 repair/replacement.

d. HMMWV's and other pumpers/engines may refill at standpipes located on the airport grounds.

3.7. Helicopter Fire Bucket Support.

a. There is no requirement to have a dedicated helicopter for fire bucket operations on site at DMR due to the type of training (non-live-fire).

b. Helicopter aviation support units will provide the Range Division Hawaii (RDH) with a list of all pilots and aircrew members that are certified and trained in fire bucket operations and fire suppression application techniques for wildland fires. This list will be submitted to the Army's wildland fire program manager and will be updated quarterly or as required.

c. Military helicopter units must provide their own fire buckets. The SB Range Control currently maintains three BAMBI fire buckets [(2) 660-gallon and (1) 2000-gallon] for emergency backup use by military UH-60, CH-53, or CH-47 aircraft assigned to conduct fire bucket operations.

d. The SB Range Control staff is responsible to ensure that a serviceable BAMBI fire bucket is available for use by trained helicopter aircrews at all times. All inoperable fire buckets will be reported to range maintenance to coordinate immediate repair or replacement.

e. The primary water source for air resources will be the ocean. For extended operations, fresh water resources may become available in the form of portable water bladders. When/if these become available, they will be the preferred water source until exhausted.

f. Air-to-ground radio communication must be established with the IC and helicopter support units involved in fire suppression activities. The capability for the IC to coordinate and direct air support with ground fire fighting crews is essential for safe and effective application. Refer to the Army's Communication Plan and Aviation Plan, for assigned radio frequencies and water resource locations on Oahu.

4. FIRE SUPPRESSION ACTIONS.

4.1. Fire Reporting and Notification Procedures.

a. Early fire detection and prompt reporting is critical for effective initial attack of wildfires on DMR. All fires, regardless of size, will be reported immediately to Range Control and in turn, to the FFD. Units will follow the fire reporting procedures below:

b. In the event of a wildland fire on any range, impact area or maneuver area, the officer in charge (OIC) will immediately notify Range Control by the most expeditious means possible (radio or telephone), stating the exact location (grid coordinates) and the extent of the fire. The OIC will immediately initiate a "cease fire" order and remain in the area with the unit subject to the orders of the City & County fire unit, FFD and/or Range Control when they arrive on the scene. Refer to DMR Operational Decision Chart, Initial Attack Plan, Enclosure 3 to this SOP.

c. In the event radio communication fails, training unit will use a cellular phone or locate the nearest telephone and dial 911 for immediate fire department response by City & County units in accordance with mutual aid support agreement.

d. Upon notification of a fire, Range Control will immediately notify the FFD by telephone

(471-7117) and provide exact location (grid coordinates), range number, maneuver area, or building number.

e. Units will not be allowed to resume training until the fire is extinguished or upon approval by the Range Operations Supervisor and/or the installation Fire Chief.

f. Failure to report any fire will result in termination of scheduled training and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

4.2. Initial Attack.

a. Immediate and aggressive response to all fires is an unconditional recommendation for DMR. Within the confines of due care for personnel safety, the high resource values of the area justify the fullest commitment to expeditious containment and control of all fires. The difficult and often hazardous fire conditions warrant total initial effort to arrest fires in the early stages. Fiscal consideration must be secondary in ensuring timely and adequate availability of necessary fire fighting resources. In reality, the savings to be realized from a successful initial attack will offset the cost of many so called “over reactions.”

b. In areas with resource values at high risk of fire loss such as the Oahu tree snail (*Achatinella*) habitat, opportunities to minimize area burned must be considered, provided it does not compromise safety standards (See Figure DMR-2).

c. Upon notification of a fire, the Range Control and FFD will immediately proceed to the scene of the fire. The first arriving unit will assume command and control of all fire fighting activities until properly relieved. At this time, the fire will be evaluated as “Routine”, “Serious”, or “Critical”.

d. Definitions:

(1) Wildland Fires (ROUTINE). Wildland fires that can be handled by the FFD.

(2) Wildland Fires (SERIOUS). Wildland fires that may require the assistance of helicopters, bulldozers, and/or military personnel under direct supervision of the FFD.

(3) Wildland Fires (CRITICAL). Wildland fires that will require the assistance of mutual aid and pose a critical threat to loss of high value resources and/or potentially may leave the installation.

e. The FFD will establish command and organize fire ground operations under the Incident Command System (ICS).

f. As the Incident Commander (IC), the Fire Chief or the Senior Fire Officer (SFO) will establish a command post when it is anticipated or the fire incident is of serious or critical nature.

g. In the event fire escapes the initial attack, the IC will implement an extended attack plan or fire escape contingency plan. (Refer to, Extended Attack Plan, Enclosure 4; Escape Fire Situation, Enclosure 5; and Monitoring Procedures, Enclosure 6, of this SOP).

h. Once resources have been committed to fire fighting, they are under the control of the IC. The IC directs the overall employment of auxiliary fire fighting resources to contain and extinguish the fire. This does not preclude unit commanders from rotating personnel and equipment necessary for rehab.

i. The IC will notify the Range Control and/or Installation Operations Center (IOC) when requesting military assistance for combating fires resulting from major fires. The primary mission of the unit commanders in the geographical area will shift from training objectives to fire control.

j. The use of military personnel will only be authorized under the most extreme circumstances. When utilized, military personnel will be under the control of a qualified fire department officer.

k. The IC will initiate action requesting mutual aid support from other fire agencies in accordance with established Cooperative Agreements when required.

l. Fires with potential for escape from and/or fires started adjacent to the DMR boundary that have potential to carry fire into high resource value areas on DMR justify the fullest commitment to aggressive containment and control of fires. The Army shall work with adjacent landowners to control fires before they encroach upon or escape the DMR boundary.

1. Types of Attack.

(a) Direct Initial Attack (IA). Direct initial attack by the training unit or trained Range Control staff at the onset can suppress fires at the point of origin while still small and prevent fires from spreading. However, fuel loads, and terrain conditions at DMR currently limit safe and effective direct attack by fire crews in some of the area. Ground fire fighting crews can be effective for containing, or at least retarding the spread of fires until water/retardant drops from helicopters are on line. Direct attack with helicopter water drops can be very effective. Aerial fire bucket operations will be utilized to control fire in remote areas that are inaccessible by ground fire fighting teams.

(b) Indirect Attack. Indirect attack is the use of ground crews or aircraft to create control lines in front of fires before the fire arrives. In areas with heavier fuel loads or when the fire is exhibiting intense behavior, indirect attack incorporating offset hand lines roads and pre-constructed firebreaks can be used as an approach. Unless conditions of the particular incident determine otherwise, fuel within compartments isolated by barriers or control lines should be expeditiously back fired (burned out to cause fuel starvation) to reduce chances of fire escape.

2. Recommendation for suppression within the firebreaks. The direct attack method is considered the best method within firebreaks. Hand crews, brush engines and aerial buckets can be used in this area. Since it is desired to suppress a fire as quickly as possible using crews with hand tools and engines/buckets with water/foam directly on a fireline is recommended. Black lines/backfiring can also be established as a control measure for fuel starvation. Due to the rough terrain in portions of the installation and the presence of cultural sites, bulldozer lines are considered a last resort and should be only sited (unless used to clear old paths) with the recommendation of the DPW Environmental Division. However, several internal access roads reduce the necessity to cut tractor lines. The firebreaks and these internal access roads provide control lines to black line/backfire off of. The HUMMER Brush Engine can maneuver on all of these roads. The 6x6 Water Tender and other Type 50/60 Brush Engines

should stay on the firebreak road. Structural engines/tenders should only be allowed on the old taxiway surrounding P-1. Several Escape/Safety zones can be designated along taxiway and in burned areas.

3. Recommendation for suppression outside the firebreaks. Both the direct attack and indirect attack method can be used outside the firebreaks. Use of aerial buckets with water/foam directly on a fireline or indirectly to establish foam or retardant lines in front of, or around a fire, is recommended. Black lines/backfiring should only be used as a last resort and only with a control line. Due to the rough terrain tractor lines are not normally practical and should be considered as a last resort. Caution should be exercised in determining escape routes and safety zone prior to employing crews in these areas. During an extended attack, DPW Environmental Division personnel can assist with establishing protection priorities.

5. POST-FIRE ACTIONS

5.1. Records and Fire Reports.

a. It is important that all fire incidents are documented to ensure an accurate fire history is maintained. Fire reports are used to track location, size, cause, and frequency for future input and use in fire trend analysis and Geographical Information Systems (GIS).

b. Range Control will maintain a log of all fires on DA Form 1594, Daily Staff Journal or Duty Officer's Log. All fire incidents will also be assigned a fire number and officially recorded on the standard Wildland Fire Incident Report form for all Army training lands. A sample Wildland Fire Incident Report form is included in this SOP (see Enclosure 9).

c. The Range Operations Supervisor will review all fire reports for accuracy and proper completion of the Wildland Fire Incident Report. A copy of each report will be faxed to the Wildland Fire Program Manager at the earliest opportunity. DPW Environmental will forward copies of all Fire Incident Reports on fires that escape the DMR boundary or cross the firebreak (once constructed) to the U.S. Fish & Wildlife Service (USFWS).

d. Fire records will be kept on an automated computer database and maintained by the Wildland Fire Program Manager for accurate fire history and fire trend analysis. The Wildland Fire Program Manager and DPW Natural Resource Manager will coordinate submission of semi-annual fire incident reports to USFWS NLT 10 July and 10 January of each calendar year.

5.2. Surveys

a. In addition to the reports and reviews that are completed immediately after a wildfire, a post-fire analysis survey of the burned area may be required depending on the fire's location and vegetation damaged. The post-fire analysis may be combined with any of the informal or formal investigations. A post-fire analysis will need to determine either all or part of the following:

(1) The effect the fire may have had on native or alien flora and fauna resources and cultural resources.

(2) The effectiveness of the pre-suppression measures including fuel modifications.

(3) The effectiveness of the suppression resources and measures used.

(4) The effectiveness of the ICS.

(5) The effectiveness of fire/fuel models used.

(6) A safety review of suppression actions.

b. A post-fire survey of the fire area will be conducted with the coordination of the DPW Environmental and ITAM office.

c. The effects of fire on threatened and endangered species or effects from catastrophic events must be surveyed at the earliest opportunity.

d. If during the survey, it becomes evident that a wildfire has occurred outside the installation boundary or the firebreak, and/or affected any BSA, SEA, or threatened any endangered species, the USFWS and the State of Hawaii, Division of Forestry & Wildlife (DOFAW) will be notified. If military training activities were determined to have caused the wildfire, the Army will reinitiate Section 7 consultation under the Endangered Species Act (ESA).

e. If a UXO survey or clearing operation is desired, coordination with the Explosive Ordnance Disposal (EOD) unit is necessary. Surveys or clearing operations must be planned, coordinated, and should be carried out immediately after a fire.

5.3. Investigations and Accident Reporting.

a. After Action Reports (AAR) will be conducted for fires of four hectares (ten acres) or more and/or during which unusual events occurred, including failure to follow instructions.

b. The RDH will request a formal investigation for fires involving any of the following:

(1) Training related caused fires escaping or starting outside the DMR boundary.

(2) Damage or loss of valuable property exceeding $1000.00.

(3) Damage of loss to Biological Sensitive Area (BSA) or incidental take of plant or animal specie.

(4) All entrapments of fire shelter deployments.

(5) Major injury or fire fatality.

ENCLOSURE 1 FIRE PREVENTION BRIEFING

The following verbiage will be included in a general safety, environmental and fire prevention briefing to be given to all personnel before training at DMR.

The purpose of this brief is to educate users of the range about the dangers of fire on the range. Fire prevention is the responsibility of every person working or training on the range. There are several reasons that fire prevention is so important. Fire poses a grave threat to endangered plants and animals at and around DMR. Fires also pose a danger of damage to archaeological sites at DMR. If a fire starts, all training must cease, and training downtime will result. For these reasons, every effort must be made to prevent range fires. In order to prevent fires, you must follow the following rules:

1. No lighted tobacco smoking materials will be discarded on the range. Smoking on the ranges is prohibited except on the old asphalt taxiway. Smoking is prohibited on the military vehicle trail (SBCT only).

2. Heat tabs and similar commercial products must be used inside metal containers.

3. The use of smoke grenades or simulators is authorized, but must be used in such a manner that will not cause fires to ignite. This means do not place smoke grenades or simulators in any vegetated area. Place them in the dirt or in metal cans provided by Range Control.

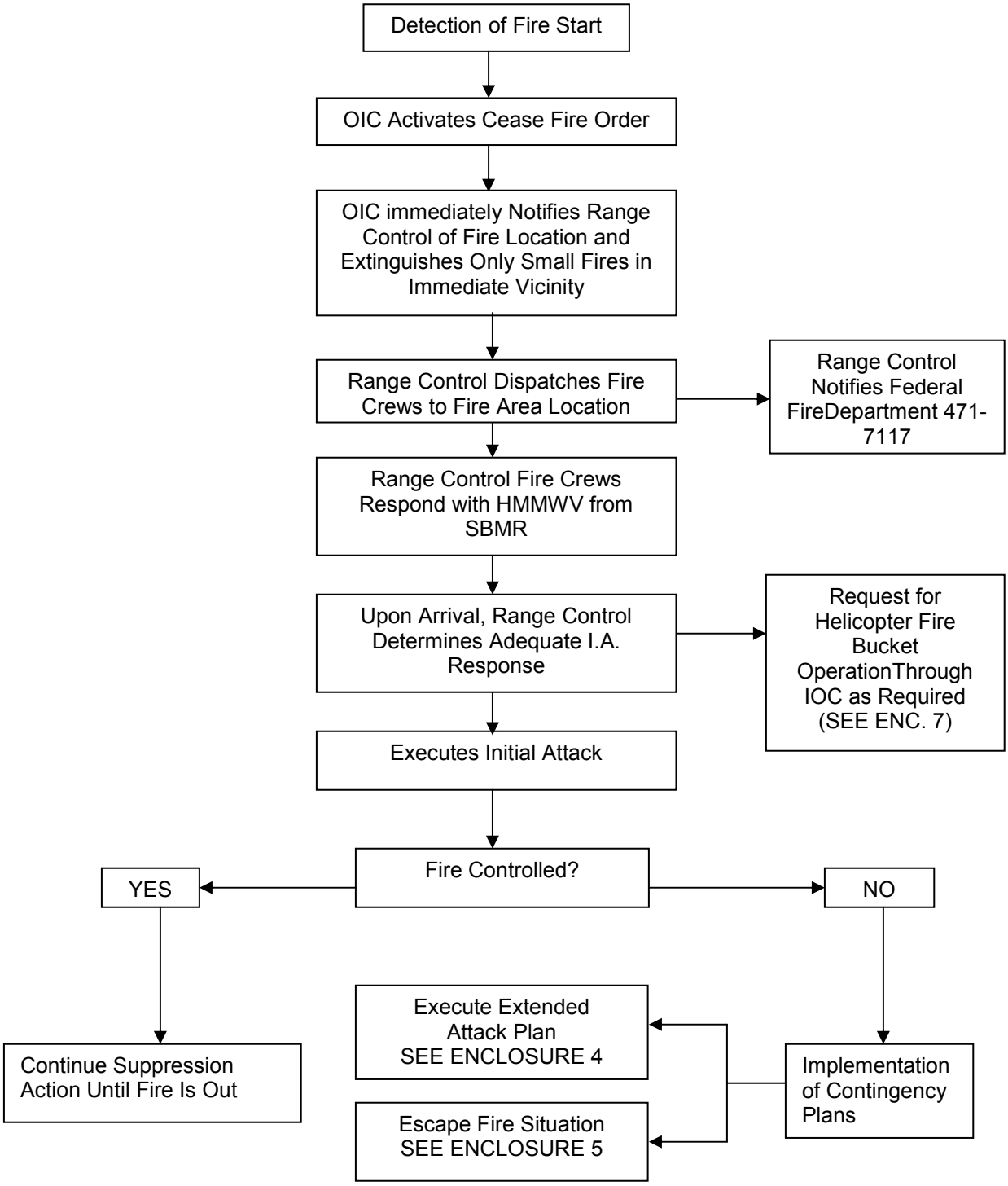
In the event a fire is started, cease training immediately. Schofield Barracks Range Control must be notified immediately. Every safe effort must be made to put the fire out, and to do so as quickly as possible. Every resource available on the Range must be committed to this effort. These resources include HUMMER Brush Engine fire trucks, and those of you that have been designated as part of the fire fighting team. Your unit leaders will advise you if you are on this team. In the event this fire fighting team is required, a trained safety technician will direct your work to put the fire out. The fire fighting team must be knowledgeable of safety and the proper use of backpacks and hand tools for fire fighting. When needed, this fire equipment will be issued at the designated rally point (Designate a rally point that everyone is familiar with). (Demonstrate the use of water backpack and fire swatter). Water for fire fighting may be made available by initial attack crews or from the fire hydrants at the airport.

ENCLOSURE 2 NOTIFICATION LIST

AGENCY NAME	PHONE NO.
FEDERAL FIRE DEPARTMENT (Emergency)	471-7117
Communications Center & Dispatch	474-2222
Honolulu Fire Department (Emergency)	911
25th ID(L) & USARHAW	
Installation Operations Center (IOC)	655-8763/8764
	655-2962 (Fax)
G3/DPTM, Range Division Hawaii	
Range Officer	655-1404
Range Operations Manager, SB	655-5243/9509
Schofield Range Control (24-hrs)	655-2292
ITAM Coordinator	655-0582/8463
Installation Fire & Safety Office	
Director	655-3350
Fire Chief	655-1331
Wildland Fire Program Manager	656-0615
	286-5818 (Cell)
DPW, Environmental Office	
Chief, Environmental	656-2878, x-1062
Natural Resource Manager	656-2878, x-1050
Cultural Resource Manager	656-2878, x-1052
Oahu Biologist	656-7641/7741
U.S. FISH & WILDLIFE SERVICE	
Field Supervisor	541-3441
Fax	541-3470
STATE OF HAWAII, DEPARTMENT OF LAND & NATURAL RESOURCES	
Division of Forestry & Wildlife	
Oahu Branch Manager	973-9787/571-9999
State Fire Protection Forester	587-4173/571-0000

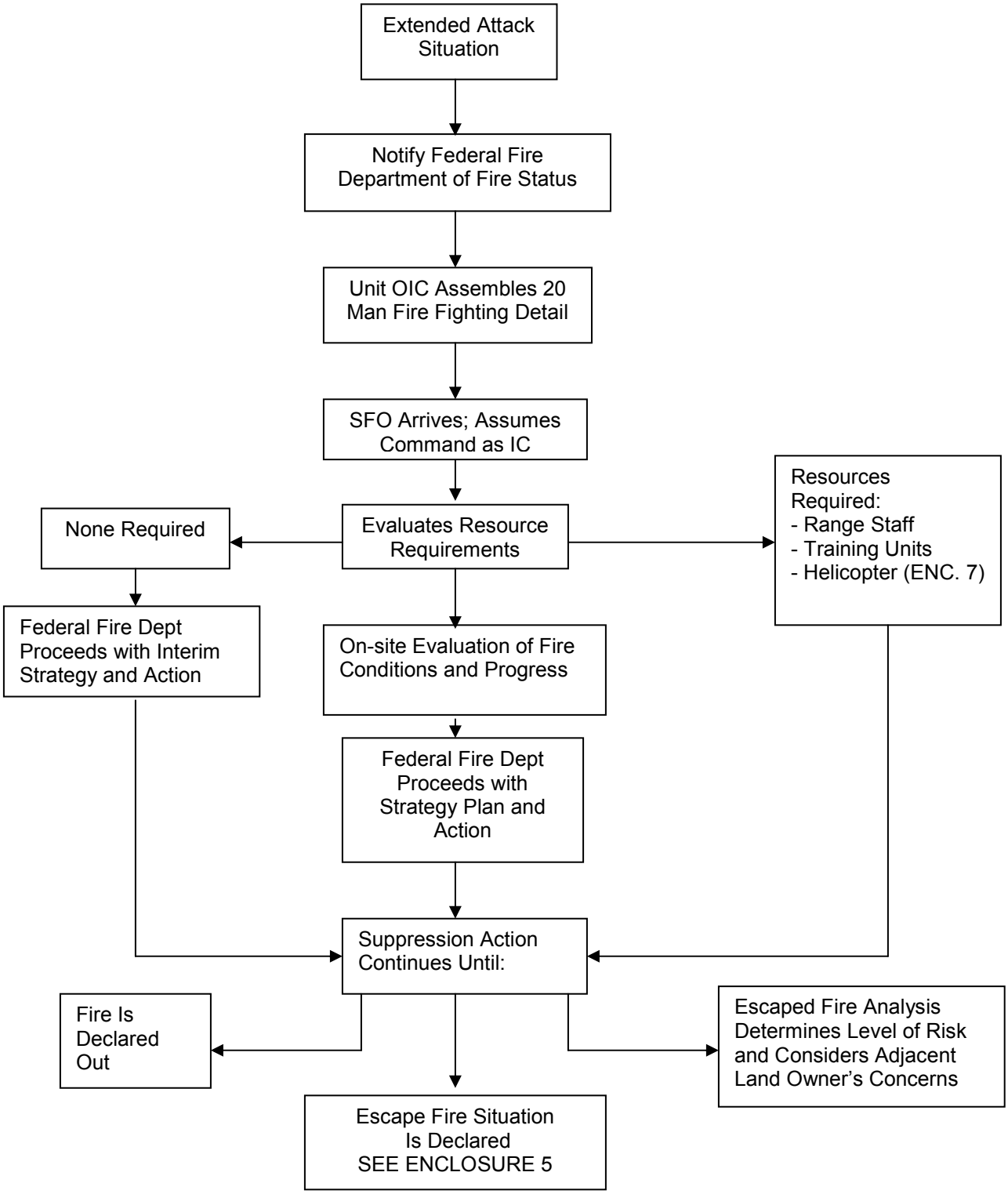
ENCLOSURE 3

DILLINGHAM MILITARY RESERVATION (DMR)
OPERATIONAL DECISION CHART
INITIAL ATTACK PLAN



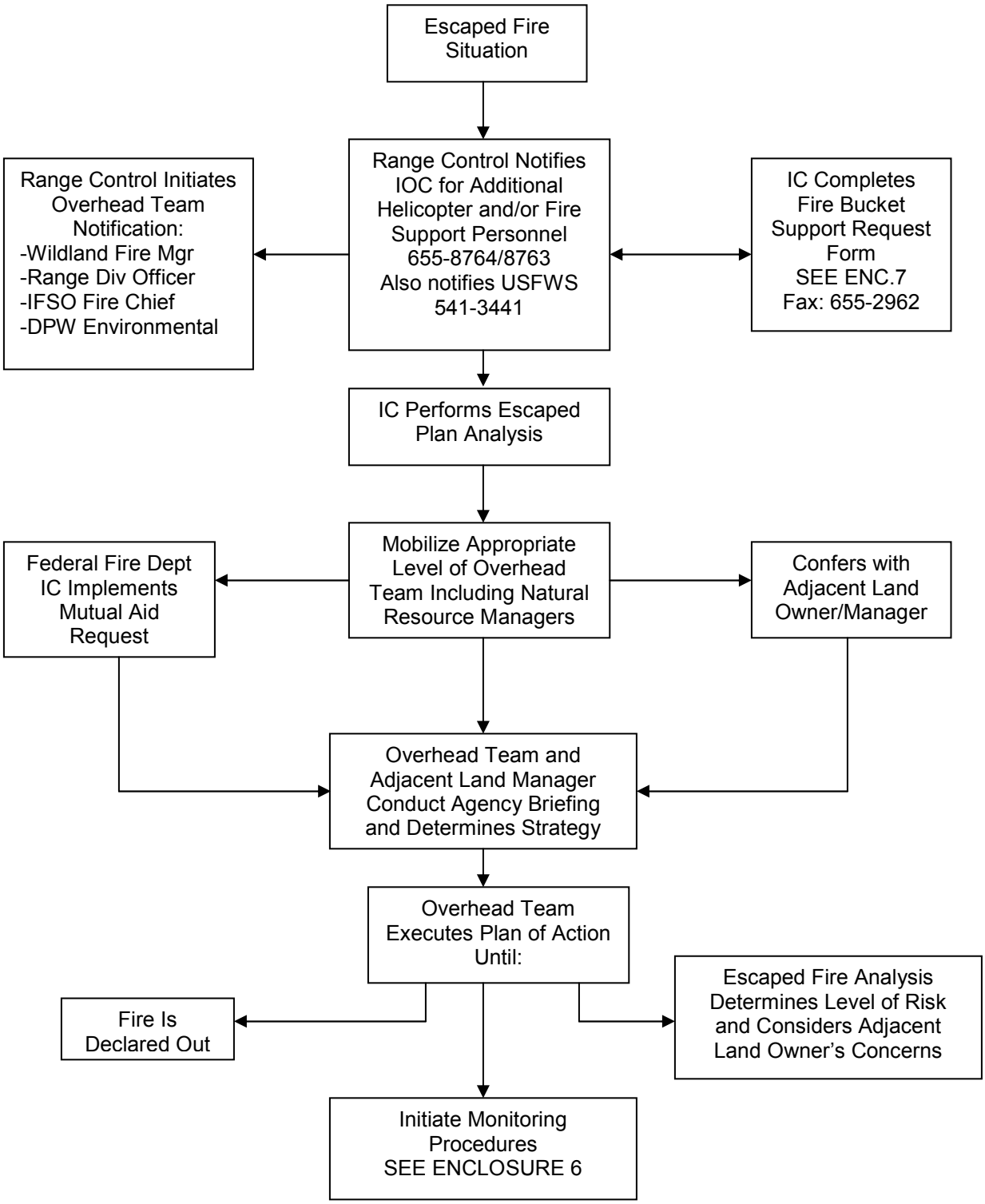
ENCLOSURE 4

DILLINGHAM MILITARY RESERVATION (DMR) OPERATIONAL DECISION CHART A, EXTENDED ATTACK PLAN



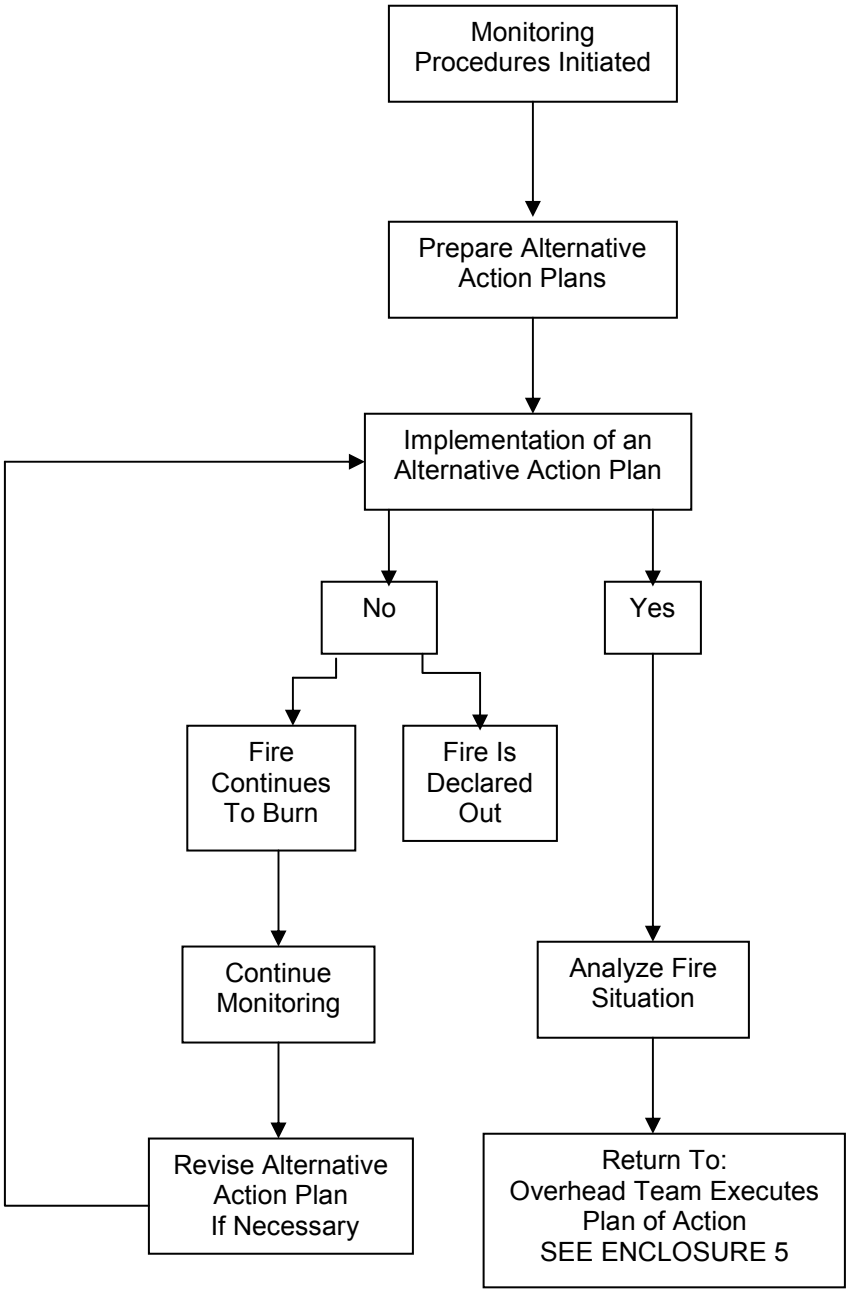
ENCLOSURE 5

DILLINGHAM MILITARY RESERVATION (DMR)
OPERATIONAL DECISION CHART B
ESCAPE FIRE SITUATION (OUTSIDE FIREBREAK)



ENCLOSURE 6

DILLINGHAM MILITARY RESERVATION (DMR)
OPERATIONAL DECISION CHART C
MONITORING PROCEDURES
(FIRES OUT OF CONTROL BEYOND DMR BOUNDARY)



ENCLOSURE 7

25th ID(L) & USARHAW Reg 350-1

Request for Rotary Wing Aircraft Support

Date of Request:

REQUEST FOR ROTARY-WINGED AVIATION SUPPORT Proponent of this Form is G3, 25 ID(L) May 97		1. Late Request? Yes / No If Yes, Letter Incl? Yes / No
2. Requesting Unit:	3. POC and Ph# or Freq and Call Sign:	4. Submitted or Coord at AMAC/G3 Conf ? If Yes, Date:
5. Date(s) Required: 5a. Unit's Cycle:	6. Number and Type of Aircraft Requested: 1x UH 60	7. MSC or SEP BN S3 AIR:
8. Pick-Up Point(s)/PZ(s):	9. Destination(s)/LZ(s):	
10. Contact at PZ:	11. Contact at LZ:	
12. Pick-Up Time:	13. Release Time:	
14. Passengers:		
15. Cargo: (type, number, weight)		
16. Special Instructions or Mission Equipment: (e.g. Headphones, Cargo Hook, C2 A/C etc.)		
17. Mission Description: (who, what, when, where, why)		
18. Initial Planning Coordination: (when and where)		
AVIATION USE ONLY		
19. Mission Received From: (name, unit, date, time)		20. Mission Number
21. Mission Passed To: (name, unit, date, time)		
22. Mission Passed To: (name, unit, date, time)		
23. Mission Passed To: (name, unit, date, time)		
24. Number of Aircraft Assigned to Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
25. Estimated Number of Hours for Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
26. Remarks:		

ENCLOSURE 8

FIRE DANGER RATING SYSTEM (FDRS) FOR DMR

FIRE DANGER RATING	BURN INDEX	FLAME LENGTH (FT)	CAUTION TO BE EXERCISED	RESTRICTIONS	HAZARD
GREEN	0-47.9	0-11	Use Normal Caution	Weather conditions favorable for all munitions authorized at DMR. Smoking is permitted.	LOW
RED	48+	11+	Use Extreme Caution	No pyrotechnics, blank fire, smoking, or cooking/warming fires allowed.	HIGH

ENCLOSURE 9 WILDLAND FIRE INCIDENT REPORT

WILDLAND FIRE INCIDENT REPORT

25TH ID(L) & USARHAW

1. INSTALLATION	2. INCIDENT NUMBER (YY-000)

3. DATE (YYMMDD)	4. FIRE LOCATION (Grid Coordinates 6 digits only)	5. RANGE OCCUPIED BY UNIT
	EJ	

6. TIME FIRE REPORTED	7. TIME FIRE OUT	8. TIME RANGE OPS RESPONDED	9. TIME FIRST SFO AT SCENE

10. AGENCY NOTIFICATION (*If applicable*)	PHONE	TIME CALLED	AT SCENE	REMARKS
❑ FEDERAL FIRE DEPARTMENT	471-7117			
❑ G3/RDH WILDLAND PROGRAM MGR	286-5818			
❑ INSTALLATION OPS CENTER (IOC)	655-8763			
❑ RANGE OFFICER	655-1404			
❑ RANGE OPERATIONS SUPERVISOR	655-9509			
❑ DPW NATURAL RESOURCE MGR	656-2878			
❑ U.S. FISH & WILDLIFE SERVICE	541-3441			
❑ (Other)				
❑ (Other)				

11. FIRE DANGER RATING	BURN INDEX (BI)	15. FIRE ESCAPE ANALYSIS	CHECK ONE	
			YES	NO
❑ GREEN ❑ YELLOW ❑ RED	13. EST. ACRES BURNED?	15a. FIRE STARTED OUTSIDE FIREBREAK ROAD?		
	14. > 10 ACRES? (AAR)	15b. FIRE ESCAPED FIREBREAK ROAD?		

16. HELICOPTER SUPPORT	16b. Aircraft Call Sign	Tail No.	16c. Arrived On Scene	Departed
☐ UH-60 ☐ CH-53 ☐ CH-46 ☐ CH-47 ☐ OTHER				
16a. BUCKET SIZE (*BAMBI*) ☐ 240-Gal ☐ 660-Gal ☐ 2000-Gal ☐ Other				

17. FIRE CAUSE (*Narrative*)	18. AMMUNITION TYPE	19. WEAPON SYSTEM
	❑ Tracer ❑ Mortar ❑ Artillery ❑ HE / WP ❑ Pyrotechnics ❑ Grenade ❑ Demo / Mines ❑ Other	❑ AT-4 ❑ TOW ❑ SAW / M-16 ❑ SMAW ❑ LAW ❑ Rocket / Missile ❑ M240/M60 ❑ Other

20. TRAINING UNIT	21. UNIT OIC	22. TELEPHONE	23. AAR REQUIRED?

24. REMARKS
(Narrative)

25. FIRE REPORT COMPLETED BY:	DATE	26. FIRE REPORT REVIEWED BY:	DATE

WILDLAND FIRE INCIDENT REPORT FORM
GENERAL INSTRUCTIONS

PURPOSE AND USE: Used in the administration of the Wildland Fire Management Program. The purpose of this form is to document all wildfire incident(s) on Army training lands under the jurisdiction of the 25th ID(L) and USARHAW within the state of Hawaii. This form will also be used to document when Army assets respond to any wildland fire incident outside of its jurisdiction in support of mutual aid requests. Documentation of all wildfires is necessary to ensure accurate fire history and trend analysis to assist fire managers in future fire management planning. The form becomes part of the permanent record file for each Fire Management Area (FMA). Fire records may be kept on an automated computer database as part of long term land management records. n

DISPOSITION OF FILES: The maintenance and disposition of all wildland fire incident reports shall be in accordance with Army record management policy. Disposition: a) OCE: Destroy after 25 years in CFA. b) Other Offices: Destroy after 5 years.

PROPONENCY: The proponent of this form is the Installation Fire & Safety Office (IFSO). Action Officer is the Wildland Fire Program Manager.

COMPLETION INSTRUCTIONS

Item 1 - Enter appropriate name of military installation where the fire occurred.

Item 2 - Fill in incident number. Enter 2 digit calendar year followed by 3 digits in numbered in sequence for the number of fires occurred during that calendar year.

Item 3 - Enter date of incident. Year, month, day (YYMMDD).

Item 4 - Fire location. Enter 6-digit grid coordinates that indicate where the fire started. Provide 6-digits only in blocks provided. *(Right, then Up)*

Item 5 - Enter range, firing point, or maneuver area the training unit causing the fire occupied at the time the fire started.

Item 6 - Enter the time of day the fire was first reported to Range control.

Item 7 - Enter the time of day the fire was reported extinguished.

Item 8 - Enter the time of day the first Range control fire crew/unit responded to the fire location.

Item 9 - Enter the time of day the first Range control fire crew/unit arrived at the fire scene.

Item 10 - Notification. Enter the time of day that Range Control first notified each agency or individual listed and enter the time each agency or individual arrived at the fire scene.

Federal Fire Dept:	Must be notified of all fires.
Wildland Fire Mgr:	Must be notified of all fires.
Installation Ops Ctr:	Notified if helicopter support or additional fire assets are required.
Range Officer:	Notified of all major fires only.
Range Ops Supv:	Must be notified of all fires.
Natural Res Mgr:	Notified if fires are potential threat to T&E plant or animal species.
USFWS:	Must be notified of all fires that escape firebreak road or installation boundary.
Remarks:	Enter appropriate comments if any.

Item 11 - Enter daily Fire Danger Rating.

Item 12 - Enter current Burn Index (BI) at the time of the fire start.

Item 13 - Enter total estimated number of acres destroyed by fire.

Item 14 - Enter YES if fire area is greater than 10 acres. The training unit OIC must submit an After-Action-Report (AAR) if fire area exceeds 10 acres. OIC must complete the AAR before clearing the range.

Item 15 - Fire Escape Analysis.
15a. Check Yes or No if fires started outside firebreak road.
15b. Check Yes or No if fires escaped the firebreak road.

Item 16 - Helicopter Support. Enter type of aircraft used on fire.
16a. Enter fire bucket size used on fire.
16b. Enter aircraft call sign tail number. (i.e., Hillclimber 150)
16c. Enter time of day aircraft arrived on scene and time aircraft departed.

Item 17 - Fill in narrative form any information as to the cause of the fire, ignition sources, or item known to have started the fire. DO NOT speculate. Validate with training unit OIC. Conduct fire investigation as required.

Item 18 - Indicate ammunition type used that caused the fire.

Item 19 - Indicate weapon system used that caused the fire.

Item 20 - Enter name of training unit that caused the fire.

Item 21 - Enter name of the OIC responsible for the training unit.

Item 22 - Enter the telephone number of the OIC of the training unit where he may be contacted in the event additional information is required.

Item 23 - Indicate if an AAR is required. If yes, AAR must be completed by the unit OIC and submitted to Range control prior to release or range clearance.

Item 24 - Remarks. Enter appropriate comments pertaining to subject wildfire incident, if any.

Item 25 - Enter date and name of individual filling out the fire report.

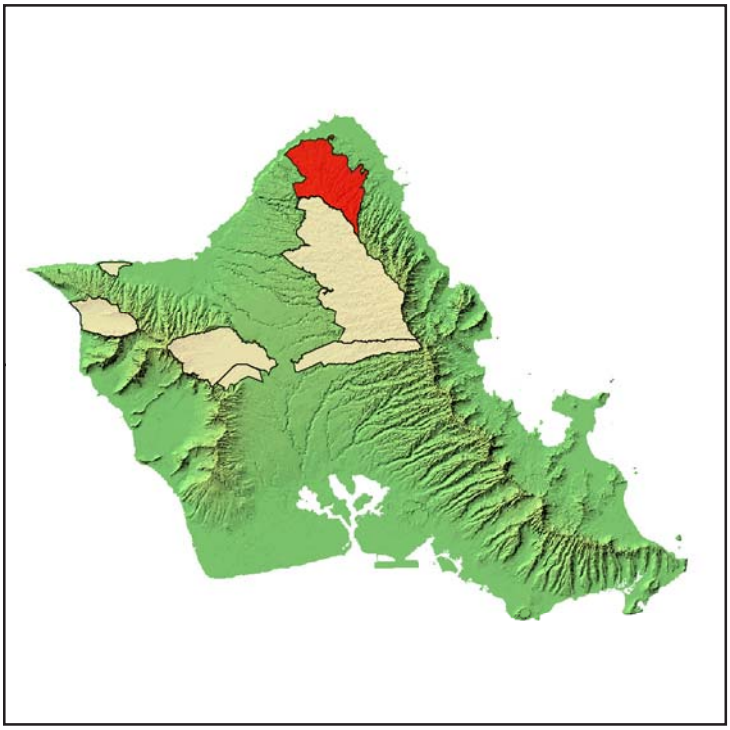
Item 26 - Enter date and name of the range supervisor reviewing the fire report. Range supervisor will review all fire incident reports for adequacy prior to submission to the wildland fire program manager.

FAX INSTRUCTIONS

A COPY OF ALL FIRE REPORTS WILL BE FAXED TO THE WILDLAND FIRE PROGRAM MANAGER WITHIN 24 HOURS AFTER THE FIRE INCIDENT IS REPORTED. ALL ORIGINAL WILDLAND FIRE INCIDENT REPORTS WILL BE MAINTAINED IN THE CURRENT FILE AREA OF EACH RESPECTIVE RANGE CONTROL OFFICE. A MAP MUST BE ATTACHED TO THE FIRE REPORT THAT IDENTIFIES AREAS BURNED.

KAHUKU
TRAINING AREA

STANDING OPERATING PROCEDURES



KAHUKU TRAINING AREA WILDFIRE SOP

1. GENERAL

1.1. Purpose.

The purpose of this Standing Operating Procedure (SOP) is to provide specific requirements that delineates the responsibilities of Federal fire department, Range Control personnel and using training units in the prevention and suppression of wildland fires at Kahuku Training Area (KTA). Its primary objective is to prevent unplanned ignitions through sound preventive measures. It also establishes procedures toward fire control and the protection of natural/cultural resources from wildfires.

1.2. Scope and Applicability.

The provisions outlined in this SOP are applicable to all military training units and personnel assigned to or utilizing KTA. Senior unit commanders, regardless of service or component, whose unit has been allocated the use of KTA, will ensure compliance with this SOP. All officers and noncommissioned officers will familiarize themselves with the contents of this SOP or receive a fire prevention briefing prior to use of the KTA range facilities. It is imperative that awareness on the part of all commanders is maintained and that all persons are instructed in fire prevention and fire suppression. It is the intent of this SOP that all persons are made so aware, and that the instructions and guidance contained herein is employed with a view towards accomplishing training with an absolute minimum of unwanted fire(s).

1.3. Responsibilities

a. Installation Commander. The Installation Commander has the overall responsibility for fire prevention and protection requirements and environmental management at KTA.

b. Director of Installation Fire and Safety Office. The Director of Installation Fire and Safety has overall responsibility for the wildland fire management program.

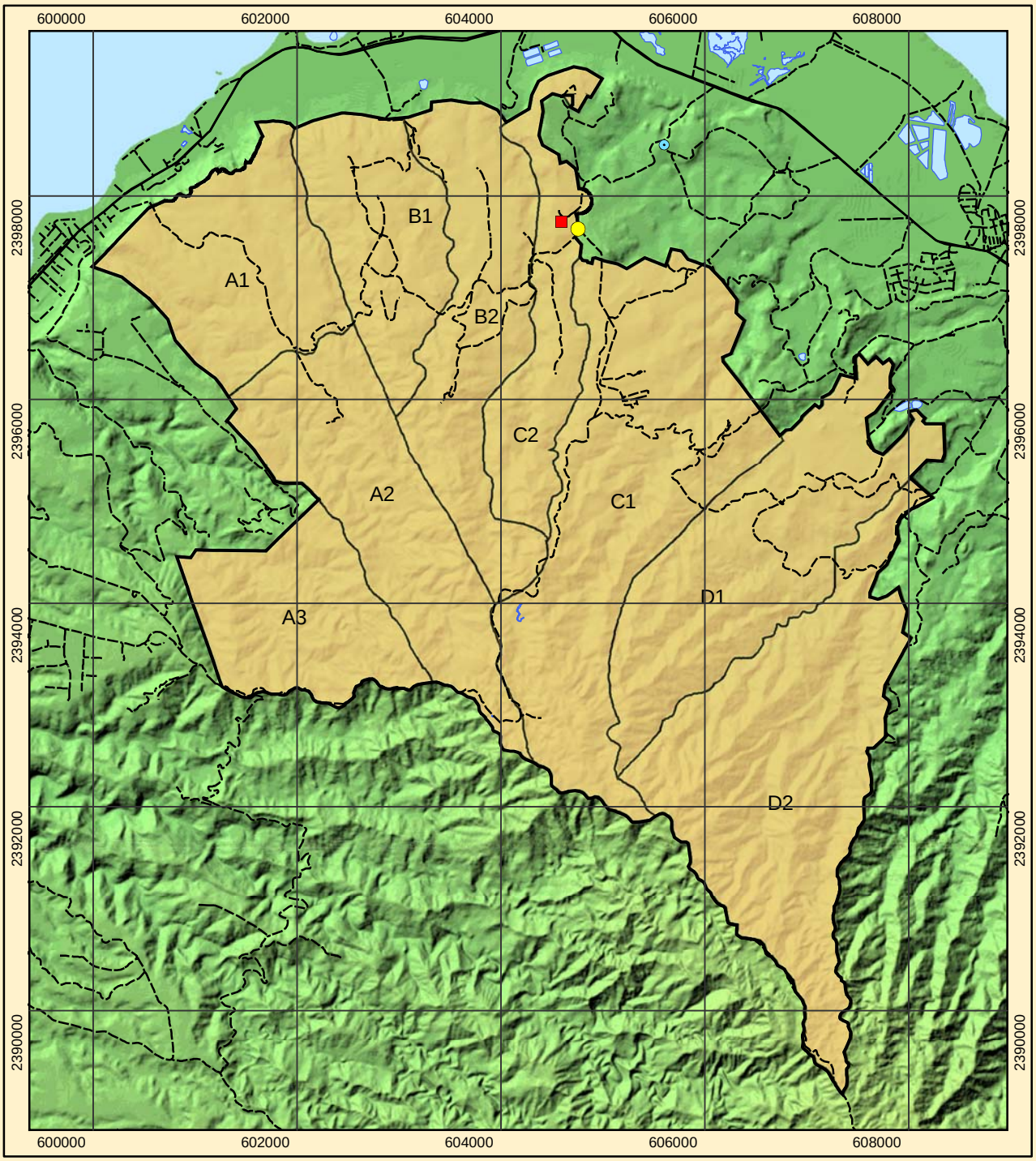
c. Fire Chief, Federal Fire Department (FFD). The installation Fire Chief is responsible for the organization, supervision, and management of all aspects of the fire prevention and protection program in accordance with the provisions of DoDI 6055.6, Fire Protection.

d. Range Officer, G3/DPTM, Range Division Hawaii. The Range Officer has overall responsibility for enforcing the provisions of the Integrated Wildland Fire Management Plan (IWFMP) and other applicable training directives and regulations, including restrictions on or cessation of training activities based on the day's fire danger rating.

e. Range Operations Supervisor, Schofield Barracks. The SB Range Operations Supervisor is responsible to the Installation Commander for ensuring proper fire prevention measures are taken by troops in rear areas; fires in forested and other training areas, when discovered, are promptly reported; and augment the Federal Fire Department in fighting any fires at KTA.

Kahuku Training Area
Fire Suppression Resource Locations

Figure KTA - 1



N

1:60,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: USARHAW IFSO

Legend

- Installation Boundary
- Training Areas
- Surface Water Body
- Proposed Dip Pond
- Hummer
- Remote Automatic Weather Station

Roads

- Primary
- Tertiary

f. Wildland Fire Program Manager, IFSO. The Wildland Fire Program Manager is responsible for the execution of the Army's wildland fire program. Collaborates with other resource managers, FFD and other cooperative fire agencies to ensure that supplies, equipment, training, and qualified personnel are available to meet the goals and objectives of the IWFMP.

g. Unit Commanders and Division Chiefs. Commanders, managers, and supervisors at all levels of the organization are responsible for ensuring unit personnel are familiar with and comply with the provisions of this SOP and applicable regulations, fire prevention restrictions, training activities within biologically sensitive areas, providing qualified personnel to support the wildland fire management program.

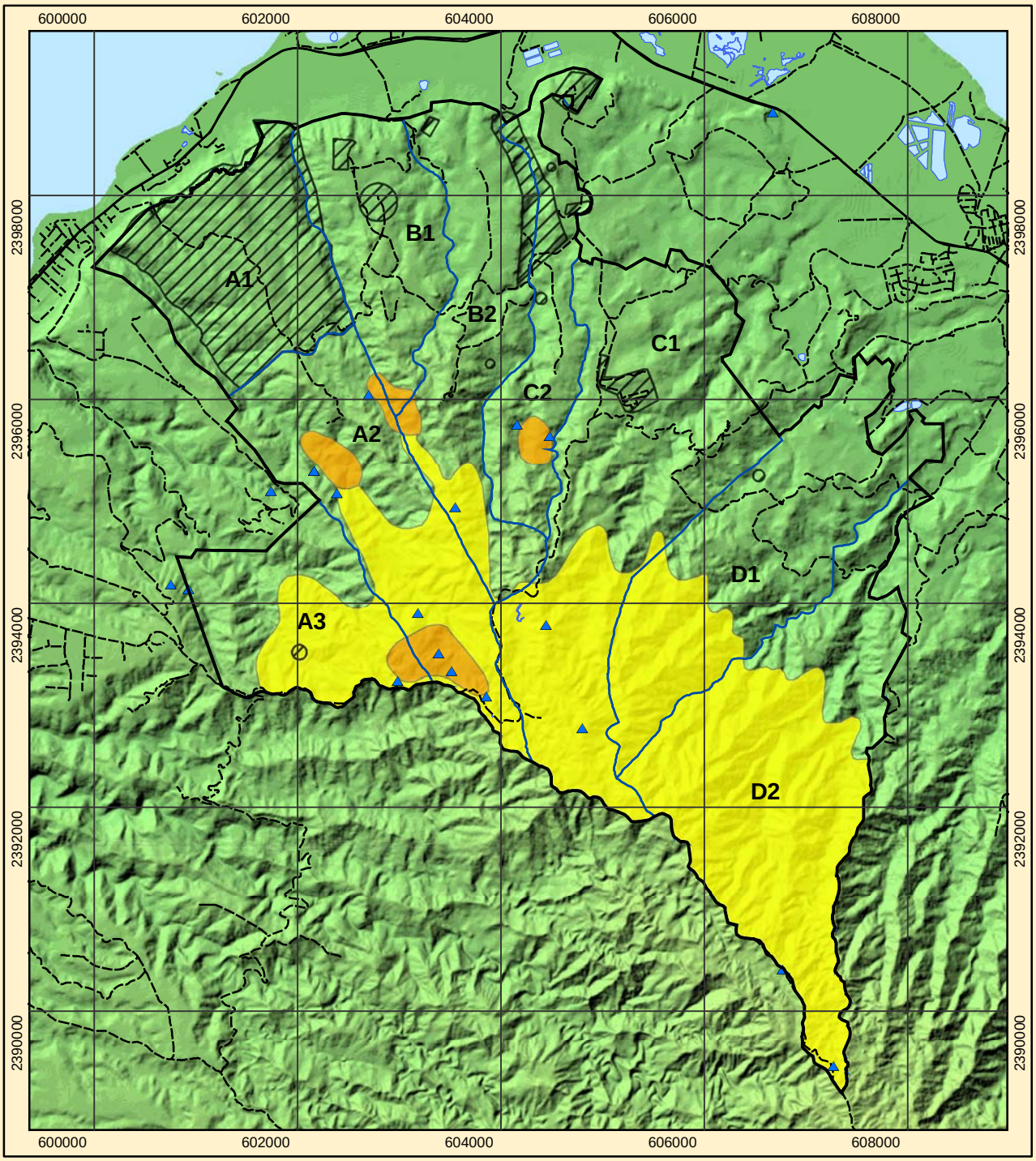
1.4. Environmental Considerations

a. Wildfires pose significant risks to threatened and endangered species of plants and animals and their native habitat. These habitats are located throughout various areas of the training ranges and adjacent outside the installation's boundary of KTA (Figure KTA-1). Cultural resources to include known archaeological sites are also found within the installation. Significant threats to the archaeological sites at KTA have generally been identified as explosive ordnance detonation, maneuvering activities, unmonitored ground disturbing activities and vegetation clearance. Fire is also a potential threat to archaeological sites from fire suppression activities.

b. Environmental Stewardship. Applicable environmental laws mandate the protection and conservation of natural/cultural resources. The use of various ammunitions, weapon systems, and pyrotechnics during live-fire training exercises increases the risk of wildfire and human or vehicular activity that can destroy native habitat. In the past, live-fire activities on Army training lands have burned large areas of native vegetation and threatened endangered species of plants and animals. The continued use of Army training lands in Hawaii greatly depends upon the Army's ability to reduce the number of fire starts and control fires within the installation boundary.

Kahuku Training Area
Protected Resources

Figure KTA - 2



1:60,000

0 500 1,000 Meters

0 0.5 1 Mile

N

Data Source: Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.

USAG HI DPW 2003.

Legend

Biological Sensitive Areas
- BSA-2
- BSA-3
- Sensitive Archeological Areas
- Federally Listed Species
- Installation Boundary
- Training Areas
- Surface Water Body

Roads
- Primary
- Tertiary

2. FIRE PREVENTION.

One of the primary objectives of this SOP is to integrate fire management actions with military training requirements and range operations. The prevention of fires is the responsibility of every individual training and/or working at KTA. Fire prevention and the ability to control the spread of fires is critical for the continued survival of endangered plants, animals and native ecosystems, and the Army's continued use of the area as a live-fire range. Currently, there are many instance where military operations conflict with the management of these special natural resources. These conflicts often result in reduced training capability as "WILDLAND FIRES STOPS TRAINING". Fire management actions are designed to reduce existing conflicts between necessary military training activities and the conservation of natural and cultural resources found within KTA.

2.1. Education.

a. Soldiers will be briefed prior to training about fire prevention, and cultural and natural resource protection. The fire prevention briefing ensures that important information is provided to using individuals that may start wildfires.

b. Signs will be posted throughout various areas as reminders of prevention and awareness of the Fire Danger Rating System (FDRS).

c. Fire prevention and environmental pocket cards will be issued to users to increase individual's awareness of fire and environmental issues.

2.2. Enforcement.

a. The primary responsibility for enforcement of range directives falls on Range Control.

b. Secondary responsibility rests with the using unit commanders.

c. Failure to follow range protocols will result in termination of scheduled training and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

2.3. Engineering. No firebreaks or other engineering projects are scheduled for KTA

2.4. Ignition Control.

a. All training will be subject to the fire danger rating system (see 3.1).

b. No fuels management is planned at this time.

3. PRE-SUPPRESSION ACTIONS.

3.1. Fire Danger Rating System.

a. Range control will be responsible for retrieving weather data from the KTA RAWS and archiving it into the "WeatherPro" software program. The BI, as determined by the National Fire Danger Rating System (NFDRS), will be used to rank fire danger based on known ignition sources.

b. The BI's will be monitored every hour, on the hour. Range control will notify the training unit every hour, and on the hour, of any training restrictions being imposed as a result of unfavorable fire danger ratings. Additionally, at any time that the BI changes from one FDRS category to another, the training unit will be notified.

c. Live-fire and tracer ammunition is prohibited at KTA. Blank ammunition and limited pyrotechnics are permitted. Range control approval and guidance must be obtained prior to firing all pyrotechnics.

d. While training at KTA, units must use caution during training exercises. Soldiers must be aware of and adhere to fire danger-rating restrictions of incendiary ammunition, pyrotechnics, smoking, and other ignition sources. Strict compliance with training restrictions set forth herein will reduce the number of fire starts. The DMR Fire Danger Rating System is as follows:

Flame Length (ft)	***Burning Index***	***Fire Index Color***
0-11	0-27.9	Green
11+	28+	Red

e. Only two fire danger categories are necessary at KTA. All munitions approved for use at KTA are authorized under the Green Fire Index. All munitions, as well as smoking, and cooking/warming fires are prohibited under the Red Fire Index. For a full list of restrictions, see Enclosure 8 of this SOP.

f. OIC's in charge of training will allow training to commence only after ascertaining that the training restrictions are in effect and adopting the appropriate fire prevention measures.

3.2. Minimum Staffing Requirements.

a. Proper staffing and fire response of the FFD shall be in accordance with DoDI 6055.6, Fire Protection.

b. An auxiliary wildland fire fighting force (Range Control) augments the FFD as first responders during initial attack operations on training ranges. At a minimum, wildland fire operations requires two (2) trained Range Control personnel for each HMMWV response. This requirement is based on the safety and complexity of the fire fighting organization during initial/extended attack operations and FFD response time from Station 15 (Schofield Barracks).

c. The range operations supervisor will arrange work schedules to allow flexibility while ensuring that minimum staffing levels are met to include overtime authorizations. In the event of fire, fire fighting duties take precedence over other work assignments.

d. One two person crew and initial attack HMMWV will be stationed at the KTA Range Control building. They will be present whenever training is underway there.

3.3. Training.

a. Policy requires that all Range Control and fire department personnel engaged in suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG). The Army's wildland fire program manager will coordinate with the FFD and Range Control staff to develop a certification-training program.

b. Individuals will not be assigned to duties for which they lack training and/or certified experience. All Range Control and fire department personnel dispatched or assigned to wildfires or prescribed fires will be qualified for the fire position assigned, unless assigned as trainees and under direct supervision of higher qualified personnel at all times.

c. The wildland fire program manager will administer and manage an effective qualification and certification program. He will monitor all employee's wildland fire management development (training and experience) to ensure accurate qualification and certification standards. All personnel engaged in wildland ground fire fighting activities must satisfactorily complete the following suppression skills courses as a minimum: S-110, Basic Fire Suppression Orientation; S-130, Firefighter Training; S-190, Introduction to Fire Behavior; and I-100, Introduction to Incident Command System (ICS).

d. The Army's wildland fire program manager will coordinate with the FFD training officer to develop the annual wildland training schedule. A recurring proficiency program will include quality instruction and evaluation of employee's proficiency level through quarterly training exercises that are monitored by the fire department training officer.

3.4. Fire Equipment and Supplies.

a. If at any time the required fire suppression equipment is not operational, training will be suspended until all equipment is operational. Training will only be conducted when fully trained/certified personnel and well functioning equipment is available for fire suppression. This requirement pertains to all types of fire fighting equipment, water resources, and personnel. Emergency contingency plans must be developed by the FFD to ensure that this requirement is met.

b. Fire Cache Supplies:

(1) The wildland fire program manager will maintain a cache of fire equipment at SBMR in a constant state of readiness. The fire cache will contain a supply of fire hand tools, chainsaws, pumps, forestry hose, foam concentrate, etc., necessary to support fire suppression activities.

(2) The wildland fire program manager will conduct periodic checks to ensure all resources are in place and will identify and immediately correct any deficiencies. The FFD District Chief shall coordinate with the Army's wildland fire program manager for equipment replacement.

3.5. Personal Protective Equipment (PPE).

a. It is mandatory that all fire fighting personnel assigned to combat fires at KTA be equipped with proper PPE necessary for combating wildfires. A full list of mandatory PPE is available in Reference 4.2.2 of the IWFMP. Range control personnel will ensure that proper PPE is worn at all times when actively engaged in fire fighting duties. Personal safety and prevention of injuries is the first priority in every fire management activity.

b. PPE for training units will be issued from the SBMR fire cache supplies. The fire cache will be maintained by the wildland fire program manager and shall be equipped to outfit a minimum of one hundred (100) firefighters with appropriate PPE.

3.6. Fire Vehicles.

a. One HMMWV equipped with 300-gallon slip-on pump unit (Class A foam capable) shall be assigned for initial attack response to KTA from Schofield Barracks.

b. Range control personnel operating fire response vehicles shall be qualified and licensed to operate emergency vehicles. The Wildland Fire Program Manager shall monitor vehicle qualification and training program for Range Control staff.

c. Personnel will perform daily preventive maintenance inspections of vehicles and pumps to ensure operational readiness. All discrepancies shall be identified and coordinated through appropriate channels for Priority 03 repair/replacement.

d. Fire vehicles can use water from the fire hydrants at any of several locations on Kamehameha Highway.

3.7. Helicopter Fire Bucket Support.

a. There is no requirement to have a dedicated helicopter for fire bucket operations on site at KTA due to the type of training (non-live-fire).

b. Military helicopter units must provide their own fire buckets. The SB Range Control currently maintains three BAMBI fire buckets [(2) 660-gallon and (1) 2000-gallon] for emergency backup use by military UH-60, CH-53, or CH-47 aircraft assigned to conduct fire bucket operations.

c. The SB Range Control staff is responsible to ensure that a serviceable BAMBI fire bucket is available for use by trained helicopter aircrews at all times. Immediately report all discrepancies and status of inoperable fire buckets to range maintenance to coordinate immediate repair or replacement.

d. Until a dip pond is constructed at KTA, water is available for aerial fire fighting from the ocean and several surface water resources outside of KTA.

e. Air-to-ground radio communication must be established with the IC and helicopter support units involved in fire suppression activities. The capability for the IC to coordinate and direct air support with ground fire fighting crews is essential for safe and effective application. Refer to

the Army's Communication Plan and Aviation Plan, for assigned radio frequencies and water resource locations on Oahu.

4. FIRE SUPPRESSION ACTIONS.

4.1. Fire Reporting and Notification Procedures.

a. Early fire detection and prompt reporting is critical in having an effective initial attack of wildfires on KTA. All fires, regardless of size, will be reported immediately to Range Control and in turn, to the FFD. Units will follow the fire reporting procedures below:

b. In the event of a wildland fire on any range, impact area or maneuver area, the officer in charge (OIC) will immediately notify the Range Control by the most expeditious means possible (radio or telephone), stating the exact location (grid coordinates) and the extent of the fire. The OIC will immediately initiate a "cease fire" order and remain in the area with the unit subject to the orders of the City & County fire unit, FFD and/or Range Control when they arrive on the scene. Refer to KTA Operational Decision Chart, Initial Attack Plan, page A-1.

c. In the event radio communication fails, training unit will use a cellular phone or locate the nearest telephone and dial 911 for immediate fire department response by City & County units in accordance with mutual aid support agreement.

d. Units will not be allowed to resume training until the fire is extinguished or upon approval by the range operations supervisor and/or the installation Fire Chief.

e. Failure to report any fire will result in termination of scheduled training and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

f. Upon notification of a fire, Range Control will immediately notify the FFD by telephone (471-7117) and provide exact location (grid coordinates), range number, maneuver area, or building number.

4.2. Initial Attack.

a. Immediate and aggressive response to all fires is an unconditional recommendation for KTA. Within the confines of due care for personnel safety, the high resource values of the area justify the fullest commitment to expeditious containment and control of all fires. The difficult and often hazardous fire conditions warrant total initial effort to arrest fires in the early stages. Fiscal consideration must be secondary in ensuring timely and adequate availability of necessary fire fighting resources. In reality, the savings to be realized from a successful initial attack will offset the cost of many so called "over reaction."

b. In areas with resource values at high risk of fire loss such as the Oahu tree snail (Achatinella) habitat, opportunities to minimize area burned must be considered, provided it does not compromise safety standards. With the progressive increase in fuel load, especially fine fuels, it is likely that requirements for pre-constructed firebreaks will increase.

c. Upon notification of a fire, the Range Control and FFD will immediately proceed to the scene of the fire. The first arriving unit will assume command and control of all fire fighting activities until properly relieved. At this time, the fire will be evaluated as “Routine”, “Serious”, or “Critical”.

d. Definitions:

(1) Wildland Fires (ROUTINE). Wildland fires that can be handled by the FFD.

(2) Wildland Fires (SERIOUS). Wildland fires that may require the assistance of helicopters, bulldozers, and/or military personnel under direct supervision of the FFD.

(3) Wildland Fires (CRITICAL). Wildland fires that will require the assistance of mutual aid and pose a critical threat to loss of high value resources and/or potentially may leave the installation.

(4) The FFD will establish command and organize fire ground operations under the Incident Command System (ICS).

(5) As the Incident Commander (IC), the Fire Chief or the Senior Fire Officer (SFO) will establish a command post when it is anticipated or the fire incident is actually of serious or critical nature.

(6) In the event fire escapes the initial attack, the IC will implement an extended attack plan or fire escape contingency plan. (Refer to Extended Attack Plan, Enclosure 4; Escape Fire Situation, Enclosure 5; and, Monitoring Procedures, Enclosure 6, of this SOP).

e. Once resources have been committed to fire fighting, they are under the control of the IC. The IC directs the overall employment of auxiliary fire fighting resources to contain and extinguish the fire. This does not preclude unit commanders from rotating personnel and equipment necessary for rehab. Particular attention must be given to the increased physical demands placed on personnel by the high altitude.

f. The IC will notify the Range Control and/or the Installation Operations Center (IOC) when requesting military assistance for combating fires resulting from major fires. The primary mission of the unit commanders in the geographical area will shift from training objectives to fire control.

g. The use of military personnel will only be authorized under the most extreme circumstances. When utilized, military personnel will be under the control of a qualified fire department officer.

h. The IC will initiate action requesting mutual aid support from other fire agencies in accordance with established Cooperative Agreements when required.

i. Fires with potential for escape from and/or fires started adjacent to the KTA boundary that have potential to carry fire into high resource value areas on KTA justify the fullest commitment to aggressive containment and control of fires. The Army shall work with adjacent landowners to control fires before they encroach upon or escape KTA boundary.

KAHUKU TRAINING AREA WILDFIRE SOP

1. Types of Attack.

(a) Direct Initial Attack (IA). Direct initial attack by the training unit or trained Range Control staff at the onset can suppress fires at the point of origin while still small and prevent fires from spreading. However, fuel loads, and terrain conditions at KTA limit safe and effective direct attack by fire crews in some of the area. Ground fire fighting crews can be effective for containing, or at least retarding the spread of fires until water/retardant drops from helicopters are on line. Direct attack with helicopter water drops can be very effective. Aerial fire bucket operations will be utilized to control fire in remote areas that are inaccessible by ground fire fighting teams.

(b) Indirect Attack. Indirect attack is the use of ground crews or aircraft to create control
lines in front of fires before the fire arrives. In areas with heavier fuel loads or when the fire is exhibiting intense behavior, indirect attack incorporating offset hand lines roads and pre-constructed firebreaks can be used as an approach. Unless conditions of the particular incident determine otherwise, fuel within compartments isolated by barriers or control lines should be expeditiously back fired (burned out to cause fuel starvation) to reduce chances of fire escape.

2. Recommendation for suppression in training areas A-1, B-1, B-2, C-1, C-2. The direct attack method is considered the best method in these locations. Hand crews, brush engines and aerial buckets can be used in this area. Since it is desired to suppress a fire as quickly as possible using crews with hand tools and engines/buckets with water/foam directly on a fireline is recommended. Black lines/backfiring can also be established as a control measure for fuel starvation if control lines can be established first. Due to the rough terrain in portions of the installation and the presence of cultural sites, bulldozer lines are considered a last resort and should be only sited (unless used to clear old paths) with the recommendation of the DPW Environmental Division. However, several internal access roads reduce the necessity to cut tractor lines. Roads throughout these training areas provide control lines to black line/backfire off of. The HUMMER Brush Engine can maneuver on all of these roads. Type 50/60 Brush Engines should be careful on all but the main roads as they are often muddy and rutted. Structural engines/tenders should only be allowed on the main roads. Several Escape/Safety zones can be designated in barren areas and at the satellite tracking station.

3. Recommendation for suppression in all other locations. Both the direct attack and indirect attack method can be used at other locations. Use of aerial buckets with water/foam directly on a fireline or indirectly to establish foam or retardant lines in front of, or around a fire, is recommended. Black lines/backfiring should not be employed. Due to the rough terrain tractor lines are not normally practical and should be considered as a last resort. Caution should be exercised in determining escape routes and safety zone prior to employing crews in these areas due to the thick and unbroken vegetation. During an extended attack, DPW Environmental Division personnel can assist with establishing protection priorities.

5. POST FIRE ACTIONS

5.1. Records and Fire Reports.

a. It is important that all fire incidents are documented to ensure accurate fire history of all fires on KTA is maintained. Fire reports are used to track location, size, cause, frequency, and fire trend analysis for future input and use in Geographical Information Systems (GIS).

b. The Range Control will maintain a log of all fires on DA Form 1594, Daily Staff Journal of Duty Officer's Log. All fire incidents will also be assigned a fire number and officially recorded on the standard Wildland Fire Incident Report (WFIR) form for all Army training lands. A sample WFIR form is included in this SOP

c. The Range Operations Supervisor will review all fire reports for accuracy and proper completion of the Wildland Fire Incident Report. A copy of each report will be faxed to the wildland fire program manager at the earliest opportunity. DPW Environmental will forward copies of all Fire Incident Reports on fires that escape outside the KTA boundary to the U.S. Fish & Wildlife Service (USFWS).

d. Fire records will be kept on an automated computer database and maintained by the wildland fire program manager necessary for accurate fire history and fire trend analysis. The wildland fire program manager and DPW Natural Resource Manager will coordinate submission of semi-annual fire incident reports to USFWS NLT 10 July and 10 January of each calendar year.

5.2. Surveys

a. In addition to the reports and reviews that are completed immediately after a wildfire, a post-fire analysis survey of the burned area may be required depending on the fire's location and vegetation damaged. The post-fire analysis may be combined with any of the informal or formal investigations. A post-fire analysis will need to determine either all or part of the following:

(1) The effect the fire may have had on native or alien flora and fauna resources and cultural resources.

(2) The effectiveness of the pre-suppression measures including fuel modifications.

(3) The effectiveness of the suppression resources and measures used.

(4) The effectiveness of the ICS.

(5) The effectiveness of fire/fuel models used.

(6) A safety review of suppression actions.

b. A post-fire survey of the fire area will be conducted with the coordination of the DPW Environmental and ITAM office.

c. The effects of fire on threatened and endangered species or effects from catastrophic events must be surveyed at the earliest opportunity.

d. If during the survey, it becomes evident that a wildfire has occurred outside the installation boundary and/or affected BSA/SEA, or threatened any endangered species, the USFWS and the State of Hawaii, Division of Forestry & Wildlife (DOFAW) will be notified. If military training activities were determined to have caused the wildfire, the Army will reinitiate Section 7 consultation under the Endangered Species Act (ESA).

e. If a UXO survey or clearing operation is desired, coordination with the Explosive Ordnance Disposal (EOD) unit is necessary. Surveys or clearing operations must be planned, coordinated, and should be carried out immediately after a fire.

5.3. Investigations and Accident Reporting.

a. After Action Reports (AAR) will be conducted for four hectares (ten acres) or more and/or which unusual events occurred, to include failure to follow instructions.

b. The RDH will request a formal investigation for fires involving any of the following:

(1) Training related caused fires escaping or starting outside KTA boundary.

(2) Damage or loss of valuable property exceeding $1000.00.

(3) Damage of loss to Biological Sensitive Area (BSA) or incidental take of plant or animal specie.

(4) All entrapments of fire shelter deployments.

(5) Major injury or fire fatality.

ENCLOSURE 1 FIRE PREVENTION BRIEFING

The following verbiage will be included in a general safety, environmental and fire prevention briefing to be given to all personnel before training at KTA.

The purpose of this brief is to educate users of the range about the dangers of fire on the range. Fire prevention is the responsibility of every person working or training on the range. There are several reasons that fire prevention is so important. Fire poses a grave threat to endangered plants and animals at KTA. Fires also pose a danger of damage to archaeological sites. If a fire starts, all training must cease, and training downtime will result. For these reasons, every effort must be made to prevent range fires. In order to prevent fires, you must follow the following rules:

1. No lighted tobacco smoking materials will be discarded on the range. Smoking on the ranges is prohibited with the exception of locations that are completely barren, such as roads.

2. Open fires are not authorized.

3. Heat tabs and similar commercial products must be used inside metal containers.

4. The use of smoke grenades or simulators is authorized, but must be used in such a manner that will not cause fires to ignite. This means do not place smoke grenades or simulators in vegetated areas. Place them in the dirt or in metal cans provided by Range Control.

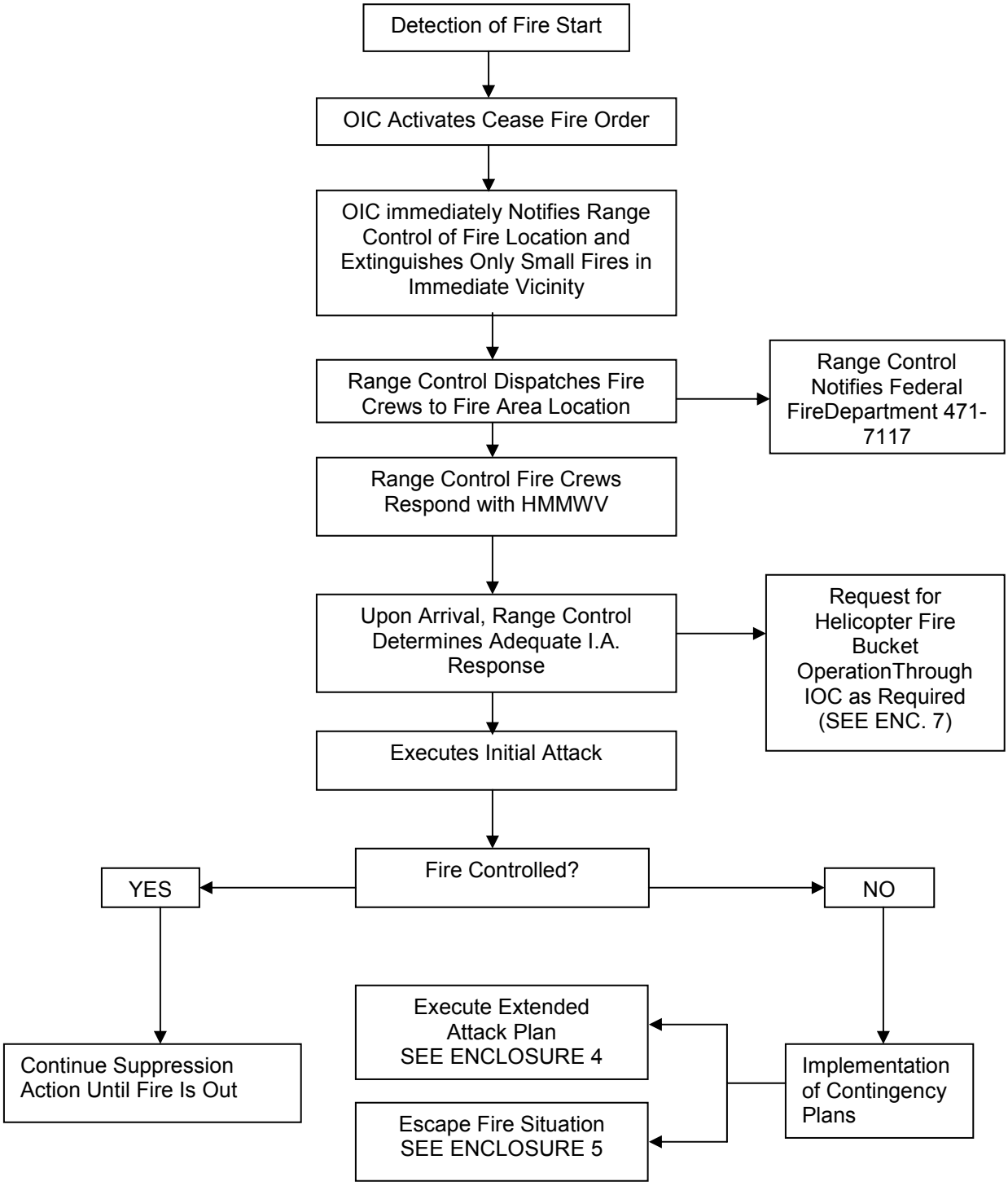
In the event a fire is started, cease training immediately. All fires, regardless of size, must be reported immediately to Kahuku Range Control by radio or telephone. Every safe effort must be made to put the fire out, and to do so as quickly as possible. Every resource available on the Range must be committed to this effort. Your unit leaders will advise you if you are on this team. In the event this fire fighting team is required, a trained safety technician will direct your work to put the fire out. The fire fighting team must be knowledgeable of safety and the proper use of backpacks and hand tools for fire fighting. When needed, this fire equipment will be issued at a designated location (designate a location that everyone is familiar with). (demonstrate the use of water backpack and fire swatter) Water for fire fighting is available from hydrants on Kamehameha Highway or from fire fighting crews.

ENCLOSURE 2 NOTIFICATION LIST

AGENCY NAME	PHONE NO.
FEDERAL FIRE DEPARTMENT (Emergency)	471-7117
Communications Center & Dispatch	474-2222
Honolulu Fire Department (Emergency)	911
25th ID(L) & USARHAW	
Installation Operations Center (IOC)	655-8763/8764
	655-2962 (Fax)
G3/DPTM, Range Division Hawaii	
Range Officer	655-1404
Range Operations Manager, SB	655-5243/9509
Schofield Range Control (24-hrs)	655-2292
ITAM Coordinator	655-0582/8463
Installation Fire & Safety Office	
Director	655-3350
Fire Chief	655-1331
Wildland Fire Program Manager	656-0615
	286-5818 (Cell)
DPW, Environmental Office	
Chief, Environmental	656-2878, x-1062
Natural Resource Manager	656-2878, x-1050
Cultural Resource Manager	656-2878, x-1052
Oahu Biologist	656-7641/7741
U.S. FISH & WILDLIFE SERVICE	
Field Supervisor	541-3441
Fax	541-3470
STATE OF HAWAII, DEPARTMENT OF LAND & NATURAL RESOURCES	
Division of Forestry & Wildlife	
Oahu Branch Manager	973-9787/571-9999
State Fire Protection Forester	587-4173/571-0000

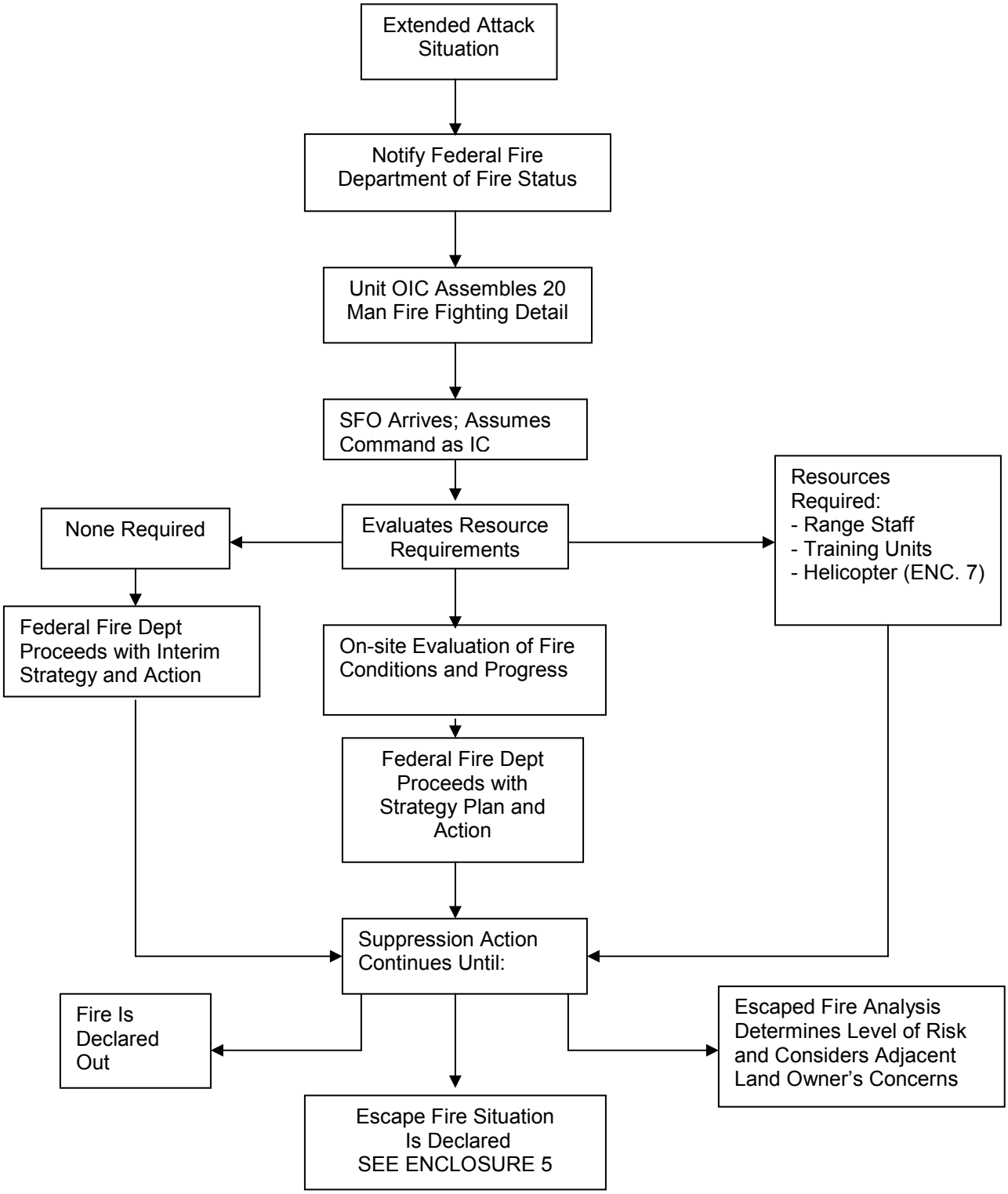
ENCLOSURE 3

KAHUKU TRAINING AREA (KTA)
OPERATIONAL DECISION CHART
INITIAL ATTACK PLAN



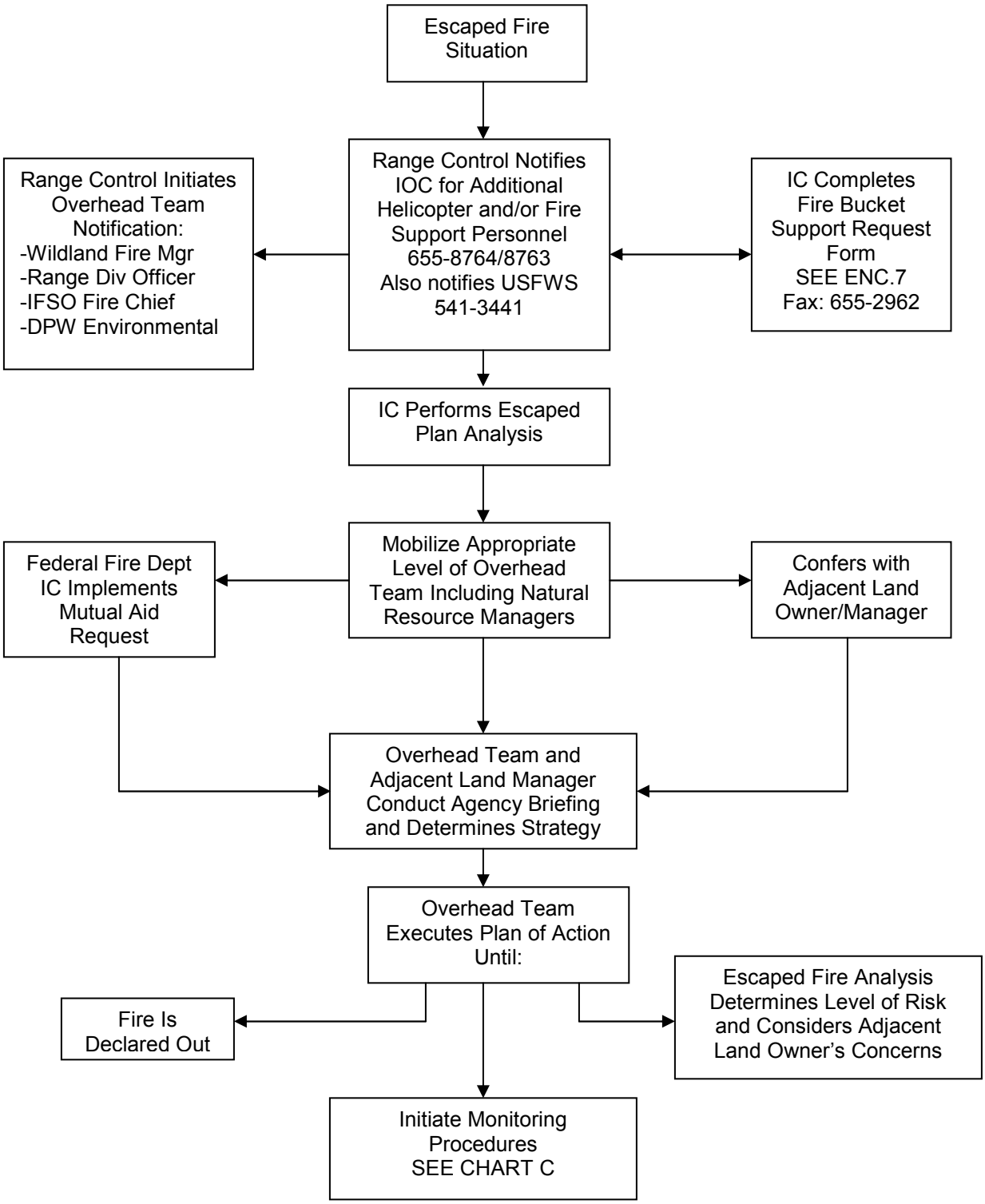
ENCLOSURE 4

KAHUKU TRAINING AREA (KTA) OPERATIONAL DECISION CHART A, EXTENDED ATTACK PLAN



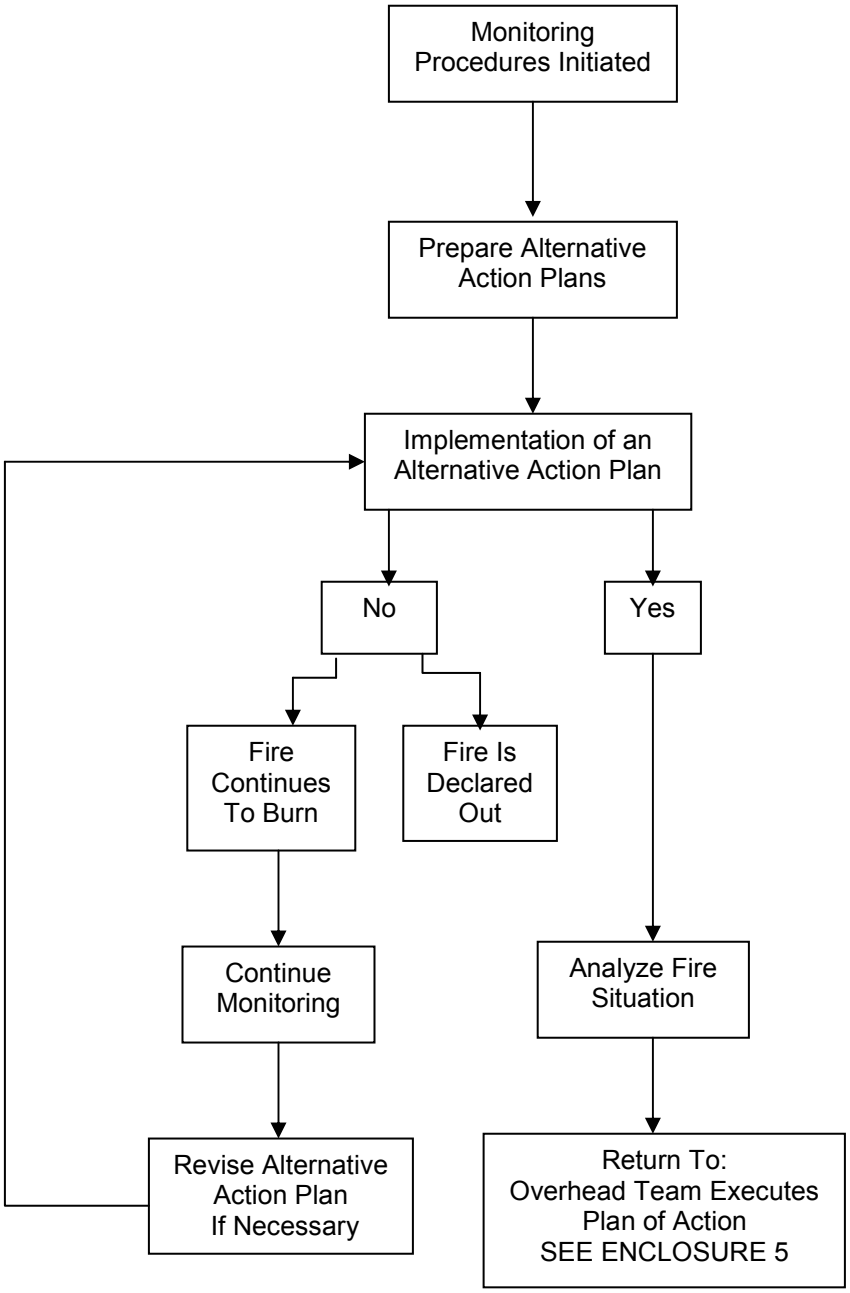
ENCLOSURE 5

KAHUKU TRAINING AREA (KTA)
OPERATIONAL DECISION CHART B
ESCAPE FIRE SITUATION



ENCLOSURE 6

KAHUKU TRAINING AREA (KTA)
OPERATIONAL DECISION CHART C
MONITORING PROCEDURES
(FIRES OUT OF CONTROL BEYOND KTA BOUNDARY)



ENCLOSURE 7

25th ID(L) & USARHAW Reg 350-1

Request for Rotary Wing Aircraft Support

Date of Request:

REQUEST FOR ROTARY-WINGED AVIATION SUPPORT Proponent of this Form is G3, 25 ID(L) May 97		1. Late Request? Yes / No If Yes, Letter Incl? Yes / No
2. Requesting Unit:	3. POC and Ph# or Freq and Call Sign:	4. Submitted or Coord at AMAC/G3 Conf ? If Yes, Date:
5. Date(s) Required: 5a. Unit's Cycle:	6. Number and Type of Aircraft Requested: 1x UH 60	7. MSC or SEP BN S3 AIR:
8. Pick-Up Point(s)/PZ(s):	9. Destination(s)/LZ(s):	
10. Contact at PZ:	11. Contact at LZ:	
12. Pick-Up Time:	13. Release Time:	
14. Passengers:		
15. Cargo: (type, number, weight)		
16. Special Instructions or Mission Equipment: (e.g. Headphones, Cargo Hook, C2 A/C etc.)		
17. Mission Description: (who, what, when, where, why)		
18. Initial Planning Coordination: (when and where)		
AVIATION USE ONLY		
19. Mission Received From: (name, unit, date, time)		20. Mission Number
21. Mission Passed To: (name, unit, date, time)		
22. Mission Passed To: (name, unit, date, time)		
23. Mission Passed To: (name, unit, date, time)		
24. Number of Aircraft Assigned to Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
25. Estimated Number of Hours for Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
26. Remarks:		

ENCLOSURE 8

FIRE DANGER RATING SYSTEM (FDRS) FOR KTA

FIRE DANGER RATING	BURN INDEX	FLAME LENGTH (FT)	CAUTION TO BE EXERCISED	RESTRICTIONS	HAZARD
GREEN	0-27.9	0-11	Use Normal Caution	Conditions favorable for all training authorized at KTA. Smoking is permitted.	LOW
RED	28+	11+	Use Extreme Caution	No Pyrotechnics. No smoking, or cooking/warming fires allowed. No Blanks or SRTA.	HIGH

ENCLOSURE 9 WILDLAND FIRE INCIDENT REPORT

WILDLAND FIRE INCIDENT REPORT

25TH ID(L) & USARHAW

1. INSTALLATION	2. INCIDENT NUMBER (YY-000)

3. DATE (YYMMDD)	4. FIRE LOCATION (Grid Coordinates 6 digits only)	5. RANGE OCCUPIED BY UNIT
	EJ	

6. TIME FIRE REPORTED	7. TIME FIRE OUT	8. TIME RANGE OPS RESPONDED	9. TIME FIRST SFO AT SCENE

10. AGENCY NOTIFICATION (*If applicable*)	PHONE	TIME CALLED	AT SCENE	REMARKS
❑ FEDERAL FIRE DEPARTMENT	471-7117			
❑ G3/RDH WILDLAND PROGRAM MGR	286-5818			
❑ INSTALLATION OPS CENTER (IOC)	655-8763			
❑ RANGE OFFICER	655-1404			
❑ RANGE OPERATIONS SUPERVISOR	655-9509			
❑ DPW NATURAL RESOURCE MGR	656-2878			
❑ U.S. FISH & WILDLIFE SERVICE	541-3441			
❑ (Other)				
❑ (Other)				

11. FIRE DANGER RATING	BURN INDEX (BI)	15. FIRE ESCAPE ANALYSIS	CHECK ONE	
			YES	NO
❑ GREEN ❑ YELLOW ❑ RED	13. EST. ACRES BURNED?	15a. FIRE STARTED OUTSIDE FIREBREAK ROAD?		
	14. > 10 ACRES? (AAR)	15b. FIRE ESCAPED FIREBREAK ROAD?		

16. HELICOPTER SUPPORT	16b. Aircraft Call Sign	Tail No.	16c. Arrived On Scene	Departed
☐ UH-60 ☐ CH-53 ☐ CH-46 ☐ CH-47 ☐ OTHER				
16a. BUCKET SIZE (*BAMBI*) ☐ 240-Gal ☐ 660-Gal ☐ 2000-Gal ☐ Other				

17. FIRE CAUSE (*Narrative*)	18. AMMUNITION TYPE	19. WEAPON SYSTEM
	❑ Tracer ❑ Mortar ❑ Artillery ❑ HE / WP ❑ Pyrotechnics ❑ Grenade ❑ Demo / Mines ❑ Other	❑ AT-4 ❑ TOW ❑ SAW / M-16 ❑ SMAW ❑ LAW ❑ Rocket / Missile ❑ M240/M60 ❑ Other

20. TRAINING UNIT	21. UNIT OIC	22. TELEPHONE	23. AAR REQUIRED?

24. REMARKS
(Narrative)

25. FIRE REPORT COMPLETED BY:	DATE	26. FIRE REPORT REVIEWED BY:	DATE

WILDLAND FIRE INCIDENT REPORT FORM
GENERAL INSTRUCTIONS

PURPOSE AND USE: Used in the administration of the Wildland Fire Management Program. The purpose of this form is to document all wildfire incident(s) on Army training lands under the jurisdiction of the 25th ID(L) and USARHAW within the state of Hawaii. This form will also be used to document when Army assets respond to any wildland fire incident outside of its jurisdiction in support of mutual aid requests. Documentation of all wildfires is necessary to ensure accurate fire history and trend analysis to assist fire managers in future fire management planning. The form becomes part of the permanent record file for each Fire Management Area (FMA). Fire records may be kept on an automated computer database as part of long term land management records. n

DISPOSITION OF FILES: The maintenance and disposition of all wildland fire incident reports shall be in accordance with Army record management policy. Disposition: a) OCE: Destroy after 25 years in CFA. b) Other Offices: Destroy after 5 years.

PROPONENCY: The proponent of this form is the Installation Fire & Safety Office (IFSO). Action Officer is the Wildland Fire Program Manager.

COMPLETION INSTRUCTIONS

Item 1 - Enter appropriate name of military installation where the fire occurred.

Item 2 - Fill in incident number. Enter 2 digit calendar year followed by 3 digits in numbered in sequence for the number of fires occurred during that calendar year.

Item 3 - Enter date of incident. Year, month, day (YYMMDD).

Item 4 - Fire location. Enter 6-digit grid coordinates that indicate where the fire started. Provide 6-digits only in blocks provided. *(Right, then Up)*

Item 5 - Enter range, firing point, or maneuver area the training unit causing the fire occupied at the time the fire started.

Item 6 - Enter the time of day the fire was first reported to Range control.

Item 7 - Enter the time of day the fire was reported extinguished.

Item 8 - Enter the time of day the first Range control fire crew/unit responded to the fire location.

Item 9 - Enter the time of day the first Range control fire crew/unit arrived at the fire scene.

Item 10 - Notification. Enter the time of day that Range Control first notified each agency or individual listed and enter the time each agency or individual arrived at the fire scene.

Federal Fire Dept:	Must be notified of all fires.
Wildland Fire Mgr:	Must be notified of all fires.
Installation Ops Ctr:	Notified if helicopter support or additional fire assets are required.
Range Officer:	Notified of all major fires only.
Range Ops Supv:	Must be notified of all fires.
Natural Res Mgr:	Notified if fires are potential threat to T&E plant or animal species.
USFWS:	Must be notified of all fires that escape firebreak road or installation boundary.
Remarks:	Enter appropriate comments if any.

Item 11 - Enter daily Fire Danger Rating.

Item 12 - Enter current Burn Index (BI) at the time of the fire start.

Item 13 - Enter total estimated number of acres destroyed by fire.

Item 14 - Enter YES if fire area is greater than 10 acres. The training unit OIC must submit an After-Action-Report (AAR) if fire area exceeds 10 acres. OIC must complete the AAR before clearing the range.

Item 15 - Fire Escape Analysis.
15a. Check Yes or No if fires started outside firebreak road.
15b. Check Yes or No if fires escaped the firebreak road.

Item 16 - Helicopter Support. Enter type of aircraft used on fire.
16a. Enter fire bucket size used on fire.
16b. Enter aircraft call sign tail number. (i.e., Hillclimber 150)
16c. Enter time of day aircraft arrived on scene and time aircraft departed.

Item 17 - Fill in narrative form any information as to the cause of the fire, ignition sources, or item known to have started the fire. DO NOT speculate. Validate with training unit OIC. Conduct fire investigation as required.

Item 18 - Indicate ammunition type used that caused the fire.

Item 19 - Indicate weapon system used that caused the fire.

Item 20 - Enter name of training unit that caused the fire.

Item 21 - Enter name of the OIC responsible for the training unit.

Item 22 - Enter the telephone number of the OIC of the training unit where he may be contacted in the event additional information is required.

Item 23 - Indicate if an AAR is required. If yes, AAR must be completed by the unit OIC and submitted to Range control prior to release or range clearance.

Item 24 - Remarks. Enter appropriate comments pertaining to subject wildfire incident, if any.

Item 25 - Enter date and name of individual filling out the fire report.

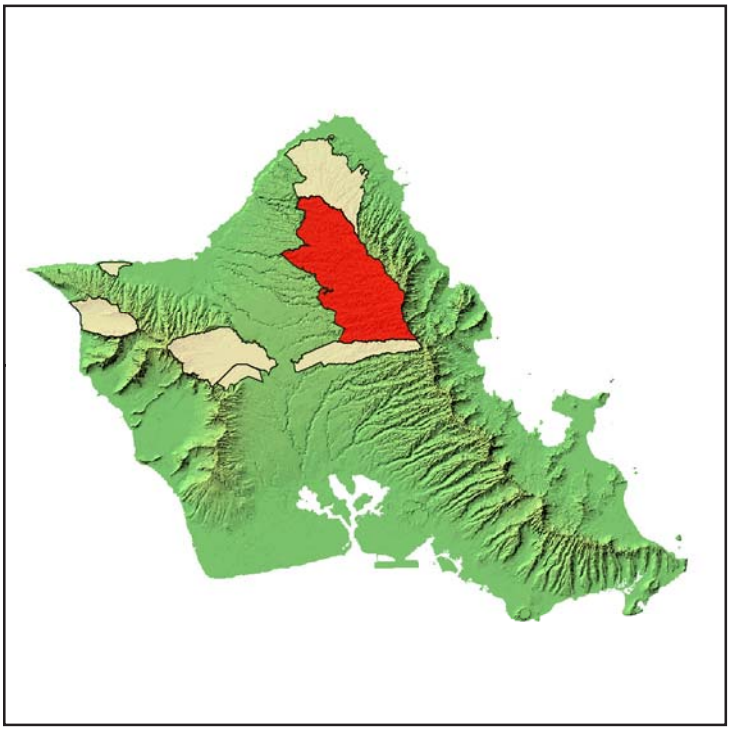
Item 26 - Enter date and name of the range supervisor reviewing the fire report. Range supervisor will review all fire incident reports for adequacy prior to submission to the wildland fire program manager.

FAX INSTRUCTIONS

A COPY OF ALL FIRE REPORTS WILL BE FAXED TO THE WILDLAND FIRE PROGRAM MANAGER WITHIN 24 HOURS AFTER THE FIRE INCIDENT IS REPORTED. ALL ORIGINAL WILDLAND FIRE INCIDENT REPORTS WILL BE MAINTAINED IN THE CURRENT FILE AREA OF EACH RESPECTIVE RANGE CONTROL OFFICE. A MAP MUST BE ATTACHED TO THE FIRE REPORT THAT IDENTIFIES AREAS BURNED.

KAWAILOA TRAINING AREA

STANDING OPERATING PROCEDURES



KAWAILOA TRAINING AREA WILDFIRE SOP

1. GENERAL

1.1. Purpose.

The purpose of this Standing Operating Procedure (SOP) is to provide specific requirements that delineate the responsibilities of Federal fire department, Range Control personnel and using training units in the prevention and suppression of wildland fires at Kawailoa Training Area (KLOA). Its primary objective is to prevent unplanned ignitions through sound preventive measures. It also establishes procedures control fire and protect natural/cultural resources. See Figure KLOA-1 for an overview.

1.2. Scope and Applicability.

The provisions outlined in this SOP are applicable to all military training units and personnel, civilian or military, assigned to or utilizing KLOA. Senior unit commanders, regardless of service or component, whose unit has been allocated the use of KLOA, will ensure compliance with this SOP. All officers and noncommissioned officers will familiarize themselves with the contents of this SOP or receive a fire prevention briefing prior to use of the KLOA range facilities. It is imperative that fire awareness on the part of all commanders is maintained and that all necessary persons are instructed in fire prevention and fire suppression. It is the intent of this SOP that all persons are made so aware, and that the instructions and guidance contained herein are employed with a view towards accomplishing training with an absolute minimum of unwanted fires.

1.3. Responsibilities

a. Installation Commander. The Installation Commander has the overall responsibility for fire prevention and protection requirements and environmental management at KLOA.

b. Director of Installation Fire and Safety Office. The Director of Installation Fire and Safety has overall responsibility for the wildland fire management program.

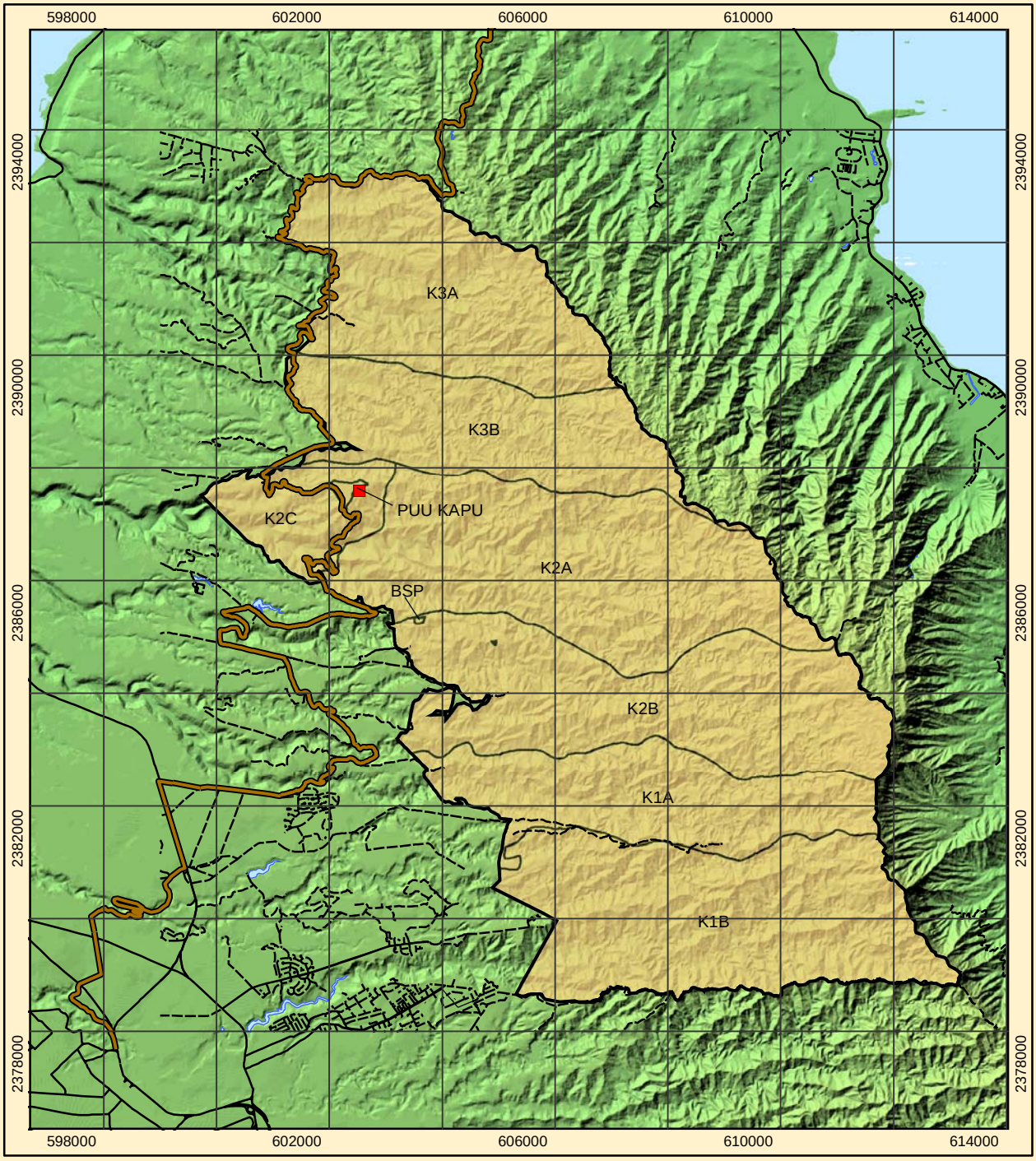
c. Fire Chief, Federal Fire Department (FFD). The installation Fire Chief is responsible for the organization, supervision, and management of all aspects of the fire prevention and protection program in accordance with the provisions of DoDI 6055.6, Fire Protection.

d. Range Officer, G3/DPTM, Range Division Hawaii. The Range Officer has overall responsibility for enforcing the provisions of the Integrated Wildland Fire Management Plan (IWFMP) and other applicable training directives and regulations, including restrictions on or cessation of training activities based on the fire danger rating.

e. Range Operations Supervisor, Schofield Barracks. The SB Range Operations Supervisor is responsible to the Installation Commander for ensuring proper fire prevention measures are taken by troops in rear areas; fires in forested and other training areas, when discovered, are promptly reported; and augmenting the Federal Fire Department in fighting any fires on KLOA.

Kawailoa Training Area
Fire Suppression Resource Locations

Figure KLOA - 1



N

1:110,000

0 2,500 5,000 Meters

0 1 2 Miles

Data Source: USARHAW IFSO

Legend

- Installation Boundary
- Training Areas
- Surface Water Body
- Proposed Remote Automatic Weather Station

Roads

- Primary
- Secondary
- Tertiary
- Military Vehicle Trail

f. Wildland Fire Program Manager, IFSO. The Wildland Fire Program Manager is responsible for the execution of the Army's wildland fire program. Collaborates with other resource managers, FFD and other cooperative fire agencies to ensure that supplies, equipment, training, and qualified personnel are available to meet the goals and objectives of the IWFMP.

g. Unit Commanders and Division Chiefs. Commanders, managers, and supervisors at all levels of the organization are responsible for ensuring unit personnel are familiar with and comply with the provisions of this SOP and applicable regulations, fire prevention restrictions, training activities within biologically sensitive areas, and providing qualified personnel to support the wildland fire management program.

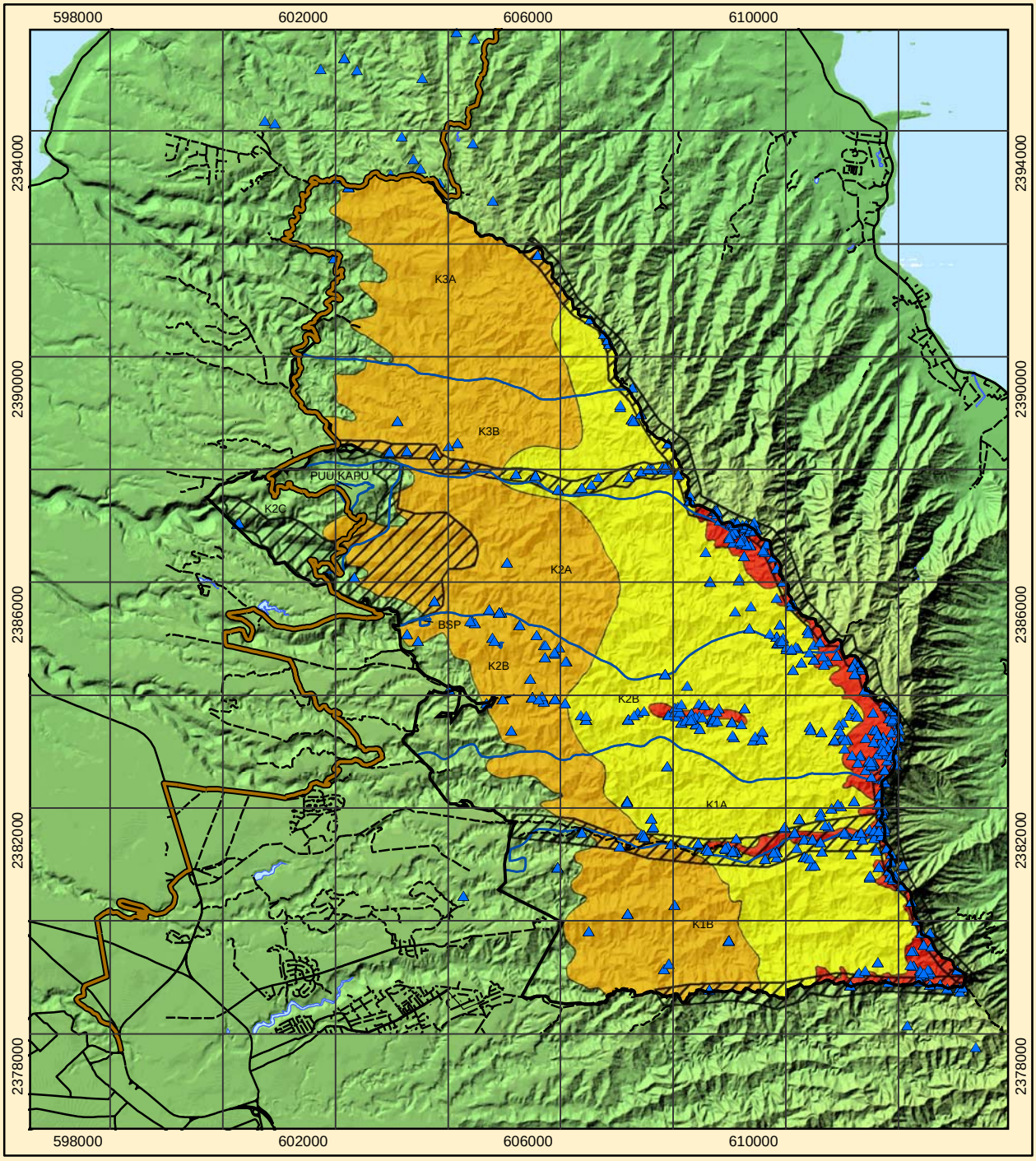
1.4. ENVIRONMENTAL CONSIDERATIONS.

a. Wildfires pose significant risks to threatened and endangered species of plants and animals and their native habitat. These habitats are located throughout the training ranges and adjacent to the installation boundary (Figure KLOA-2). Cultural resources are also found within the installation. Significant threats to the archaeological sites at KLOA have generally been identified as explosive ordnance detonation, maneuvering activities, unmonitored ground disturbing activities, and vegetation clearance. Fire is also a potential threat to archaeological sites from fire suppression activities.

b. Environmental Stewardship. Applicable environmental laws mandate the protection and conservation of natural/cultural resources. The use of various ammunitions, weapon systems, and pyrotechnics during live-fire training exercises increases the risk of wildfire and human or vehicular activity that can destroy native habitat. In the past, live-fire activities on Army training lands have burned large areas of native vegetation and threatened endangered species of plants and animals. The continued use of Army training lands in Hawaii greatly depends upon the Army's ability to reduce the number of fire starts and control fires within the installation boundary.

Kawailoa Training Area
Protected Resources

Figure KLOA - 2



N

1:110,000

0 2,500 5,000 Meters

0 1 2 Miles

Data Source: Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.

USAG HI DPW 2003.

Legend

Biological Sensitive Areas
- BSA-1
- BSA-2
- BSA-3
- Sensitive Archeological Areas
- Federally Listed Species
- Installation Boundary
- Training Areas
- Surface Water Body

Roads
- Primary
- Secondary
- Tertiary
- Military Vehicle Trail

2. FIRE PREVENTION.

One of the primary objectives of this SOP is to integrate fire management actions with military training requirements and range operations. The prevention of fires is the responsibility of every individual training and/or working at KLOA. Fire prevention and the ability to control the spread of fires is critical for the continued survival of endangered plants, animals and native ecosystems, and the Army's continued use of the area as a live-fire range. Currently, there are many instance where military operations conflict with the management of these special natural resources. These conflicts often result in reduced training capability as "WILDLAND FIRES STOPS TRAINING". Fire management actions are designed to reduce existing conflicts between necessary military training activities and the conservation of natural and cultural resources found within KLOA.

2.1. Education.

a. Soldiers will be briefed prior to training about fire prevention, and cultural and natural resource protection. The fire prevention briefing ensures that important information is provided to using individuals that may start wildfires.

c. Signs will be posted throughout various areas as reminders of prevention and awareness of the Fire Danger Rating System (FDRS).

d. Fire prevention and environmental pocket cards will be issued to users to increase individual's awareness of fire and environmental issues.

2.2. Enforcement.

a. The primary responsibility for enforcement of range directives falls on Range Control.

b. Secondary responsibility rests with the using unit commanders.

c. Failure to follow range protocols will result in termination of scheduled training and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

2.3. Engineering. No firebreak or other construction projects are planned for KLOA.

2.4. Ignition Control.

a. All training will be subject to the fire danger rating system (see 3.1 and Enclosure 8 of this SOP).

b. No fuels management is planned at this time.

3. PRE-SUPPRESSION ACTIONS

3.1. Fire Danger Rating System.

a. While training at KLOA, units must use caution during non live-fire training exercises. Soldiers must be aware of and adhere to fire danger-rating restrictions of incendiary ammunition and/or pyrotechnics under identified fire weather parameters. Strict compliance with training restrictions set forth herein will reduce the number of fire starts.

b. Schofield Barracks Range Control will be responsible for retrieving weather data from the KLOA RAWS and archiving it into the "WeatherPro" software program. The BI, as determined by the National Fire Danger Rating System (NFDRS), will be used to rank fire danger based on known ignition sources.

c. The BI's will be monitored every hour, on the hour, and prior to projected "hot" range status. Range control will notify the training unit every hour, and on the hour, of any training restrictions being imposed as a result of unfavorable fire danger ratings. Additionally, at any time that the BI changes from one category to another, the training unit will be notified.

d. Live-fire, tracer ammunition, and pyrotechnics are prohibited at KLOA. Blank ammunition is permitted.

e. OIC's in charge of training will allow non live-fire training to commence only after ascertaining that the training restrictions are in effect and adopting the appropriate fire prevention measures.

f. The FDRS for KLOA is as follows:

Flame Length (ft)	***Burning Index****	***Fire Index Color***
0-11	0-30.9	Green
11+	31+	Red

3.2. Minimum Staffing Requirements

a. Proper staffing and fire response of the FFD shall be in accordance with DoDI 6055.6, Fire Protection.

b. An auxiliary wildland fire fighting force (Range Control) augments the FFD as first responders during initial attack operations on training ranges. At a minimum, wildland fire operations requires two (2) trained Range Control personnel for each HMMWV response. This requirement is based on the safety and complexity of the fire fighting organization during initial/extended attack operations and FFD response time from Station 15 (Schofield Barracks).

c. The range operations supervisor will arrange work schedules to allow flexibility while ensuring that minimum staffing levels are met to include overtime authorizations. In the event of fire, fire fighting duties take precedence over other work assignments.

d. At KLOA there is no requirement for aerial or ground fire fighting resources to be on site during training.

3.3. Training.

a. Policy requires that all Range Control and fire department personnel engaged in suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG). The Army's wildland fire program manager will coordinate with the FFD and Range Control staff to develop a certification-training program.

b. Individuals will not be assigned to duties for which they lack training and/or certified experience. All Range Control and fire department personnel dispatched or assigned to wildfires or prescribed fires will be qualified for the fire position assigned, unless assigned as trainees and under direct supervision of higher qualified personnel at all times.

c. The wildland fire program manager will administer and manage an effective qualification and certification program. He will monitor all employee's wildland fire management development (training and experience) to ensure accurate qualification and certification standards. All personnel engaged in wildland ground fire fighting activities must satisfactorily complete the following suppression skills courses as a minimum: S-110, Basic Fire Suppression Orientation; S-130, Firefighter Training; S-190, Introduction to Fire Behavior; and I-100, Introduction to Incident Command System (ICS).

d. The Army's wildland fire program manager will coordinate with the FFD training officer to develop the annual wildland training schedule. A recurring proficiency program will include quality instruction and evaluation of employee's proficiency level through quarterly training exercises that are monitored by the fire department training officer.

3.4. Fire Equipment and Supplies.

a. If at any time the required fire suppression equipment is not operational, training will be suspended until all equipment is operational. Training will only be conducted when fully trained/certified personnel and well functioning equipment is available for fire suppression. This requirement pertains to all types of fire fighting equipment, water resources, and personnel. Emergency contingency plans must be developed by the FFD to ensure that this requirement is met.

b. Fire Cache Supplies:

(1) The wildland fire program manager will maintain a cache of fire equipment at SBMR in a constant state of readiness. The fire cache will contain a supply of fire hand tools, chainsaws, pumps, forestry hose, foam concentrate, etc., necessary to support fire suppression activities.

(2) The wildland fire program manager will conduct periodic checks to ensure all resources are in place and will identify and immediately correct any deficiencies.

3.5. Personal Protective Equipment.

a. It is mandatory that all fire fighting personnel assigned to combat fires at KLOA be equipped with proper PPE necessary for combating wildfires. See Reference 4.2.2 of the IWFMP for a full list of required PPE. Range control personnel will ensure that proper PPE is worn at all times when actively engaged in fire fighting duties. Personal safety and prevention of injuries is the first priority in every fire management activity.

b. PPE for training units will be issued from the fire cache supplies. The fire cache will be maintained by the wildland fire program manager and shall be equipped to outfit a minimum of one hundred (100) firefighters with appropriate PPE.

3.6. Fire Vehicles.

a. One HMMWV equipped with 300-gallon slip-on pump unit (Class A foam capable) shall be assigned for initial attack response to KLOA from Schofield Barracks.

b. Range control personnel operating fire response vehicles shall be qualified and licensed to operate emergency vehicles. The Wildland Fire Program Manager shall monitor vehicle qualification and training program for Range Control staff.

c. Personnel will perform daily preventive maintenance inspections of vehicles and pumps to ensure operational readiness. All discrepancies shall be identified and coordinated through appropriate channels for Priority 03 repair/replacement.

3.7. Helicopter Fire Bucket Support.

a. There is no requirement to have a dedicated helicopter for fire bucket operations on site at KLOA due to the type of training (non-live-fire).

b. Helicopter aviation support units will provide the Range Division Hawaii (RDH) with a list of all pilots and aircrew members that are certified and trained in fire bucket operations and fire suppression application techniques for wildland fires. List will be submitted to the Army's wildland fire program manager and will be updated quarterly or as required.

c. Military helicopter units must provide their own fire buckets. The SB Range Control currently maintains three BAMBI fire buckets [(2) 660-gallon and (1) 2000-gallon] for emergency backup use by military UH-60, CH-53, or CH-47 aircraft assigned to conduct fire bucket operations.

d. The SB Range Control staff is responsible to ensure that a serviceable BAMBI fire bucket is available for use by trained helicopter aircrews at all times. Immediately report all discrepancies and status of inoperable fire buckets to range maintenance to coordinate immediate repair or replacement.

e. The helicopter crew must transient to an approved water resource site for water. There are a number of surface water resources bordering KLOA that aerial and ground resources can use to refill buckets, engines, or pumpers. These include Kawailoa 18, Opaeula 16, Opaeula 15, Opaeula 2, and Helemano.

f. Air-to-ground radio communication must be established with the FFD and helicopter support units involved in fire suppression activities. The capability for the IC to coordinate and direct air support with ground fire fighting crews is essential for safe and effective application. Refer to the Army's Communication Plan and Aviation Plan, for assigned radio frequencies and water resource locations on Oahu.

4. FIRE SUPPRESSION ACTIONS.

4.1. Fire Reporting Procedures.

a. Early fire detection and prompt reporting is critical in having an effective initial attack of wildfires on KLOA. All fires, regardless of size, will be reported immediately to Range Control and in turn, to the FFD. Units will follow the fire reporting procedures below:

b. In the event of a wildland fire on any range or maneuver area, the officer in charge (OIC) will immediately notify the Range Control by the most expeditious means possible (radio or telephone), stating the exact location (grid coordinates) and the extent of the fire. The OIC will immediately initiate a “cease fire” order and remain in the area with the unit subject to the orders of the City & County fire unit, FFD and/or Range Control when they arrive on the scene. Refer to KLOA Operational Decision Chart, Initial Attack Plan, Enclosure 3.

c. In the event radio communication fails, training unit will use a cellular phone or locate the nearest telephone and dial 911 for immediate fire department response by City & County units in accordance with mutual aid support agreement.

d. Units will not be allowed to resume training until the fire is extinguished or upon approval by the range operations supervisor and/or the installation Fire Chief.

e. Failure to report any fire will result in termination of scheduled training and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

f. Upon notification of a fire, Range Control will immediately notify the FFD by telephone (471-7117) and provide exact location (grid coordinates), range number, maneuver area, or building number.

4.2. Initial Attack.

a. Immediate and aggressive response to all fires is an unconditional recommendation for KLOA. Within the confines of due care for personnel safety, the high resource values of the area justify the fullest commitment to expeditious containment and control of all fires. The difficult and often hazardous fire conditions warrant total initial effort to arrest fires in the early stages. Fiscal consideration must be secondary in ensuring timely and adequate availability of necessary fire fighting resources. The savings to be realized from a successful initial attack will offset the cost of many so called “over reaction.”

b. In areas with resource values at high risk of fire loss such as the Oahu tree snail (*Achatinella*) habitat, opportunities to minimize area burned must be considered, provided it does not compromise safety standards.

c. Upon notification of a fire, the Range Control and FFD will immediately proceed to the scene of the fire. The first arriving unit will assume command and control of all fire fighting activities until properly relieved. At this time, the fire will be evaluated as “Routine”, “Serious”, or “Critical”.

d. Definitions:

(1) Wildland Fires (ROUTINE). Wildland fires that can be handled by the FFD.

(2) Wildland Fires (SERIOUS). Wildland fires that may require the assistance of helicopters, bulldozers, and/or military personnel under direct supervision of the FFD.

(3) Wildland Fires (CRITICAL). Wildland fires that will require the assistance of mutual aid and pose a critical threat to loss of high value resources and/or potentially may leave the installation.

e. The FFD will establish command and organize fire ground operations under the Incident Command System (ICS).

f. As the Incident Commander (IC), the Fire Chief or the Senior Fire Officer (SFO) will establish a command post when it is anticipated or the fire incident is actually of serious or critical nature.

g. In the event fire escapes the initial attack, the IC will implement an extended attack plan or fire escape contingency plan. (Refer to Extended Attack Plan, Enclosure 4; Escape Fire Situation, Enclosure 5; and Monitoring Procedures, Enclosure 6, of this SOP).

h. Once resources have been committed to fire fighting, they are under the control of the IC. The IC directs the overall employment of auxiliary fire fighting resources to contain and extinguish the fire. This does not preclude unit commanders from rotating personnel and equipment necessary for rehab. Particular attention must be given to the increased physical demands placed on personnel by the high altitude.

i. The IC will notify the Range Control and/or DOC when requesting military assistance for combating fires resulting from major fires. The primary mission of the unit commanders in the geographical area will shift from training objectives to fire control.

j. The use of military personnel will only be authorized under the most extreme circumstances. When utilized, military personnel will be under the control of a qualified fire department officer.

k. The IC will initiate action requesting mutual aid support from other fire agencies in accordance with established Cooperative Agreements when required.

l. Fires with potential for escape from and/or fires started adjacent to the KLOA boundary that have potential to carry fire into high resource value areas on KLOA justify the fullest commitment to aggressive containment and control of fires. The Army shall work with adjacent landowners to control fires before they encroach upon or escape KLOA boundary.

1. Types of Attack.

(a) Direct Initial Attack (IA). Direct initial attack by the training unit or trained Range Control staff at the onset can suppress fires at the point of origin while still small and prevent fires from spreading. However, fuel loads and terrain conditions at KLOA currently limit safe and effective direct attack by fire crews in some of the area. Ground fire fighting crews can be effective for containing, or at least retarding the spread of fires until water/retardant drops from

helicopters are on line. Direct attack with helicopter water drops can be very effective. Aerial fire bucket operations will be utilized to control fire in remote areas that are inaccessible by ground fire fighting teams.

(b) Indirect Attack. Indirect attack is the use of ground crews or aircraft to create control lines in front of fires before the fire arrives. In areas with heavier fuel loads or when the fire is exhibiting intense behavior, indirect attack incorporating offset hand lines roads and pre-constructed firebreaks can be used as an approach. Unless conditions of the particular incident determine otherwise, fuel within compartments isolated by barriers or control lines should be expeditiously back fired (burned out to cause fuel starvation) to reduce chances of fire escape.

2. Recommendation for suppression. Both the direct attack and indirect attack method can be used, depending on the individual situation. Use of aerial buckets with water/foam directly on a fireline or indirectly to establish foam or retardant lines in front of, or around a fire, is recommended. Black lines/backfiring should almost never be used at KLOA. They should only be considered as an absolute last resort and only with a control line. Due to the rough terrain, tractor lines are not normally practical and should only be considered as a last resort. Caution should be exercised in determining escape routes and safety zone prior to employing crews in these areas since there are few breaks in the vegetation. During an extended attack, DPW Environmental Division personnel can assist with establishing protection priorities.

5. POST-FIRE ACTIONS

5.1. Records and Fire Reports.

a. It is important that all fire incidents are documented to ensure accurate fire history of all fires on KLOA is maintained. Fire reports are used to track location, size, cause, frequency, and fire trend analysis for future input and use in Geographical Information Systems (GIS).

b. The Range Control will maintain a log of all fires on DA Form 1594, Daily Staff Journal of Duty Officer's Log. All fire incidents will also be assigned a fire number and officially recorded on the standard Wildland Fire Incident Report form for all Army training lands. A sample Wildland Fire Incident Report form is included in this SOP.

c. The Range Operations Supervisor will review all fire reports for accuracy and proper completion of the Wildland Fire Incident Report. A copy of each report will be faxed to the wildland fire program manager at the earliest opportunity. DPW Environmental will forward copies of all Fire Incident Reports on fires that escape outside the KLOA boundary to the U.S. Fish & Wildlife Service (USFWS).

d. Fire records will be kept on an automated computer database and maintained by the wildland fire program manager necessary for accurate fire history and fire trend analysis. The wildland fire program manager and DPW Natural Resource Manager will coordinate submission of semi-annual fire incident reports to USFWS NLT 10 July and 10 January of each calendar year.

5.2. Surveys.

a. In addition to the reports and reviews that are completed immediately after a wildfire, a post-fire analysis survey of the burned area may be required depending on the fire's location and vegetation damaged. The post-fire analysis may be combined with any of the informal or formal investigations. A post-fire analysis will need to determine either all or part of the following:

(1) The effect the fire may have had on native or alien flora and fauna resources and cultural resources.

(2) The effectiveness of the pre-suppression measures including fuel modifications.

(3) The effectiveness of the suppression resources and measures used.

(4) The effectiveness of the ICS.

(5) The effectiveness of fire/fuel models used.

(6) A safety review of suppression actions.

b. A post-fire survey of the fire area will be conducted with the coordination of the DPW Environmental and ITAM office.

c. The effects of fire on threatened and endangered species or effects from catastrophic events must be surveyed at the earliest opportunity.

d. If during the survey, it becomes evident that a wildfire has affected a BSA/SEA, or threatened any endangered species, the USFWS and the State of Hawaii, Division of Forestry & Wildlife (DOFAW) will be notified. If military training activities were determined to have caused the wildfire, the Army will reinitiate Section 7 consultation under the Endangered Species Act (ESA).

5.3. Investigations and Accident Reporting.

a. After Action Reports (AAR) will be conducted for four hectares (ten acres) or more and/or which unusual events occurred, to include failure to follow instructions.

b. The RDH will request a formal investigation for fires involving any of the following:

(1) Training related caused fires escaping or starting outside KLOA boundary.

(2) Damage or loss of valuable property exceeding $1000.00.

(3) Damage of loss to Biological Sensitive Area (BSA) or incidental take of plant or animal specie.

(4) All entrapments of fire shelter deployments.

(5) Major injury or fire fatality.

ENCLOSURE 1 FIRE PREVENTION BRIEFING

The following verbiage will be included in a general safety, environmental and fire prevention briefing to be given to all personnel before training at KLOA.

The purpose of this brief is to educate users of the range about the dangers of fire on the range. Fire prevention is the responsibility of every person working or training on the range. There are several reasons that fire prevention is so important. Fire poses a grave threat to endangered plants and animals at KLOA. Fires also pose a danger of damage to archaeological sites. If a fire starts, all training must cease, and training downtime will result. For these reasons, every effort must be made to prevent range fires. In order to prevent fires, you must follow the following rules:

1. No lighted tobacco smoking materials will be discarded on the range. Smoking on the ranges is prohibited except on Drum Road. Smoking is prohibited on the military vehicle trail (SBCT only).

2. Open fires are not authorized.

3. Heat tabs and similar commercial products must be used inside metal containers.

4. No live-fire or pyrotechnics of any kind are authorized.

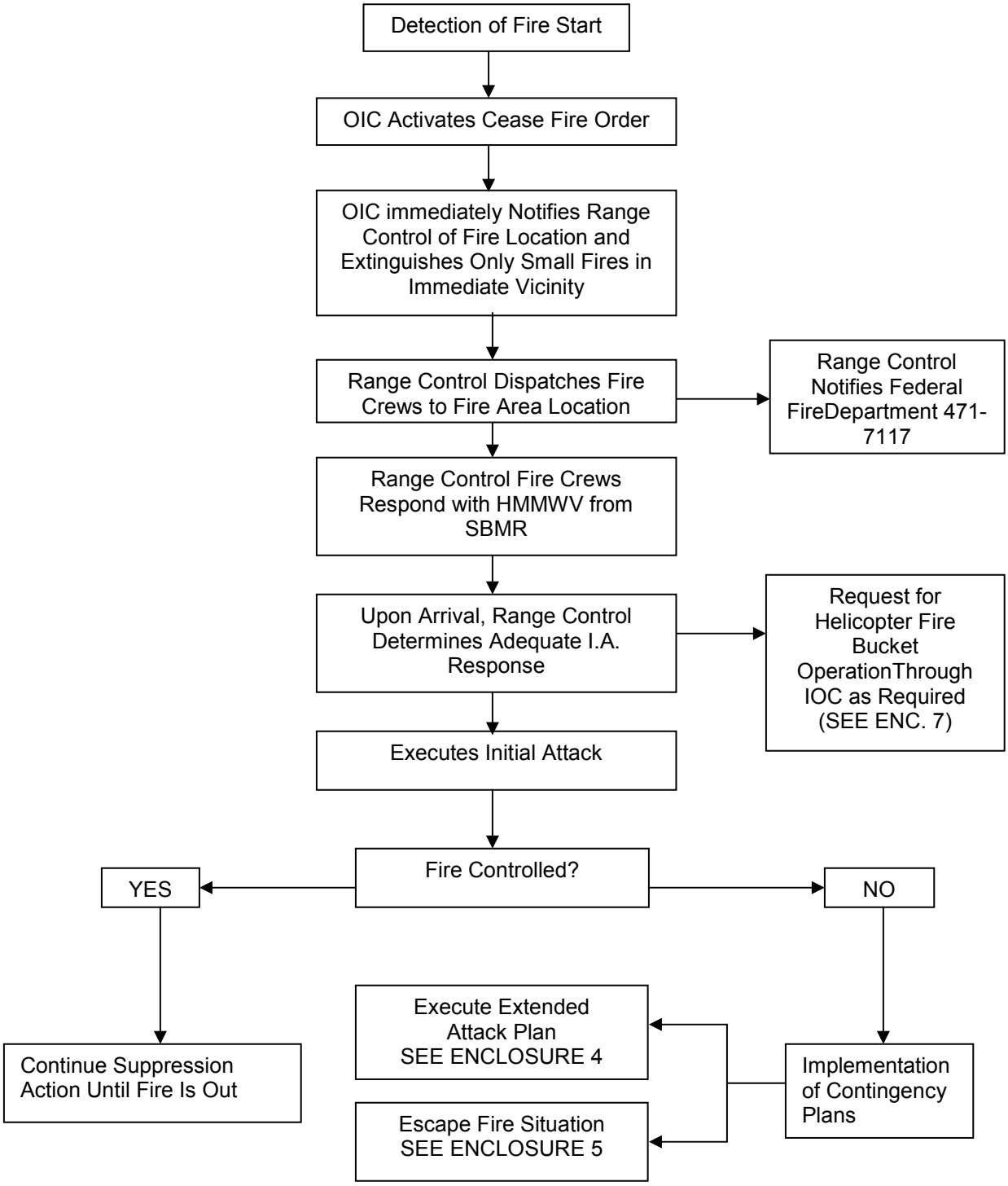
In the event a fire is started, cease training immediately. All fires, regardless of size, must be reported immediately to Schofield Barracks Range Control by radio or telephone. Every safe effort must be made to put the fire out, and to do so as quickly as possible. Your unit leaders will advise you if you are on this team. In the event this fire fighting team is required, a trained safety technician will direct your work to put the fire out. The fire fighting team must be knowledgeable of safety and the proper use of backpacks and hand tools for fire fighting. When needed, this fire equipment will be issued to you. (demonstrate the use of water backpack and fire swatter) Water for fire fighting is limited at KLOA. Should it be necessary, you will be notified where to get it.

ENCLOSURE 2 NOTIFICATION LIST

AGENCY NAME	PHONE NO.
FEDERAL FIRE DEPARTMENT (Emergency)	471-7117
Communications Center & Dispatch	474-2222
Honolulu Fire Department (Emergency)	911
25th ID(L) & USARHAW	
Installation Operations Center (IOC)	655-8763/8764
	655-2962 (Fax)
G3/DPTM, Range Division Hawaii	
Range Officer	655-1404
Range Operations Manager, SB	655-5243/9509
Schofield Range Control (24-hrs)	655-2292
ITAM Coordinator	655-0582/8463
Installation Fire & Safety Office	
Director	655-3350
Fire Chief	655-1331
Wildland Fire Program Manager	656-0615
	286-5818 (Cell)
DPW, Environmental Office	
Chief, Environmental	656-2878, x-1062
Natural Resource Manager	656-2878, x-1050
Cultural Resource Manager	656-2878, x-1052
Oahu Biologist	656-7641/7741
U.S. FISH & WILDLIFE SERVICE	
Field Supervisor	541-3441
Fax	541-3470
STATE OF HAWAII, DEPARTMENT OF LAND & NATURAL RESOURCES	
Division of Forestry & Wildlife	
Oahu Branch Manager	973-9787/571-9999
State Fire Protection Forester	587-4173/571-0000

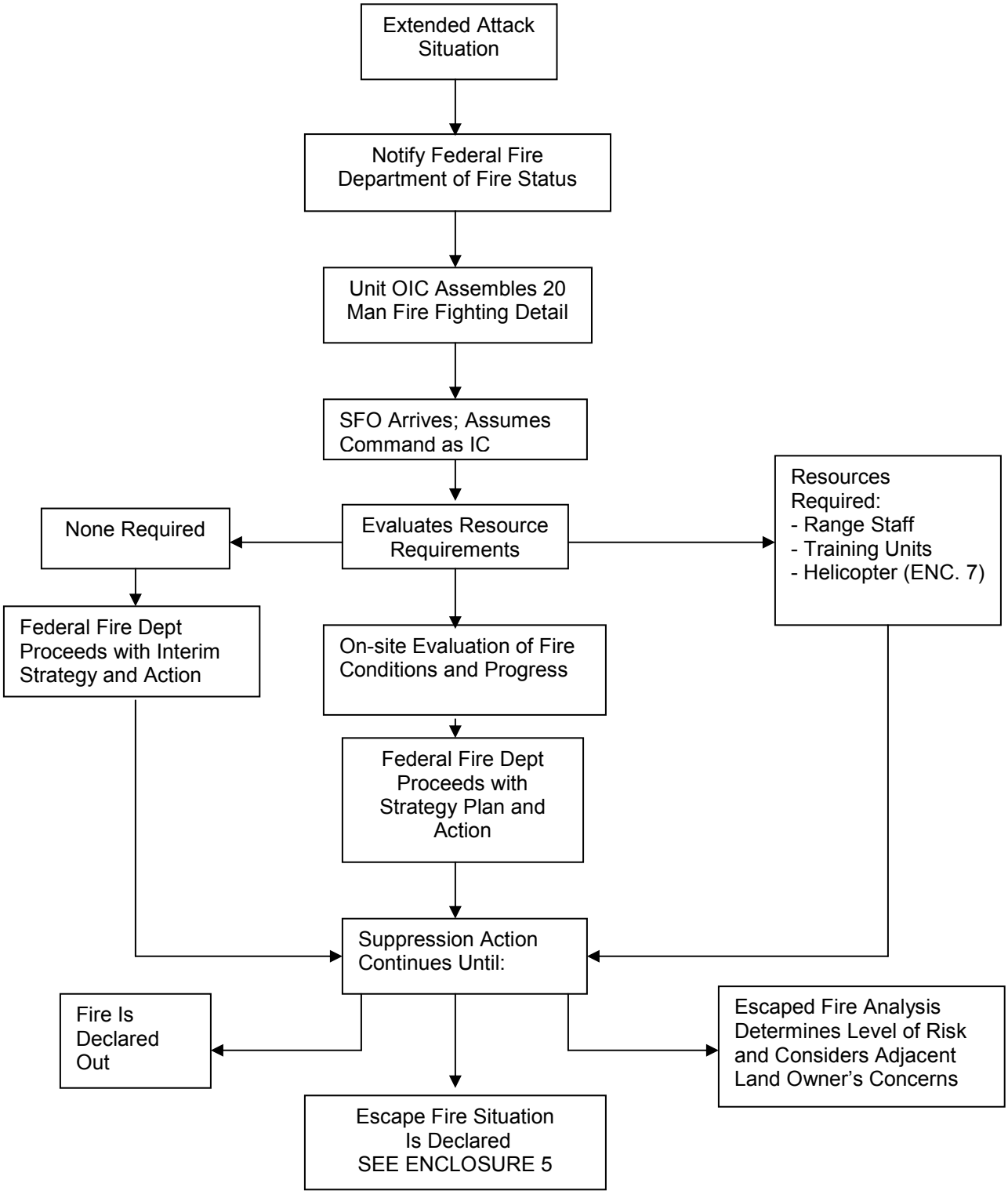
ENCLOSURE 3

KAWAILOA TRAINING AREA (KLOA)
OPERATIONAL DECISION CHART
INITIAL ATTACK PLAN



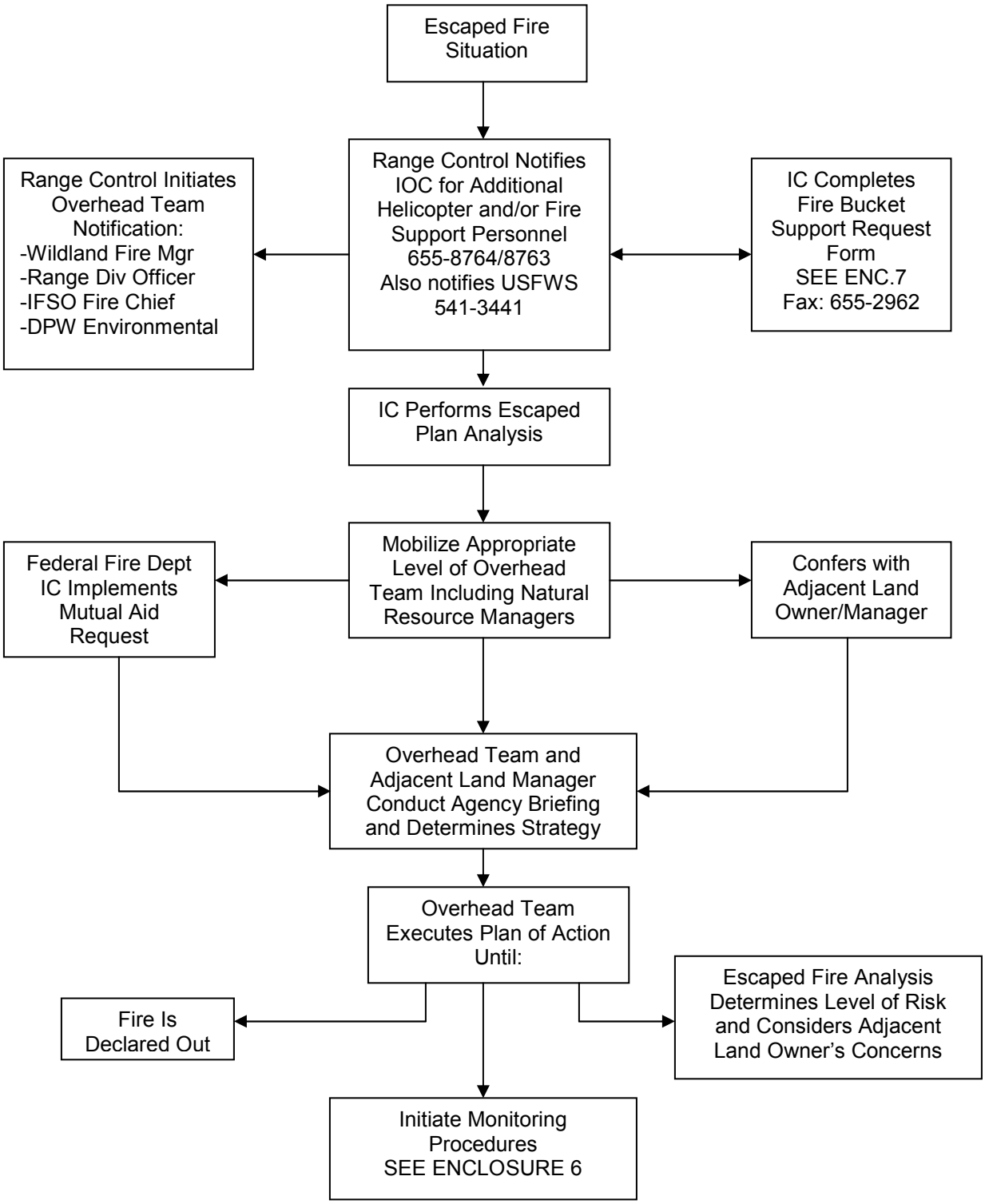
ENCLOSURE 4

KAWAILOA TRAINING AREA (KLOA) OPERATIONAL DECISION CHART A, EXTENDED ATTACK PLAN



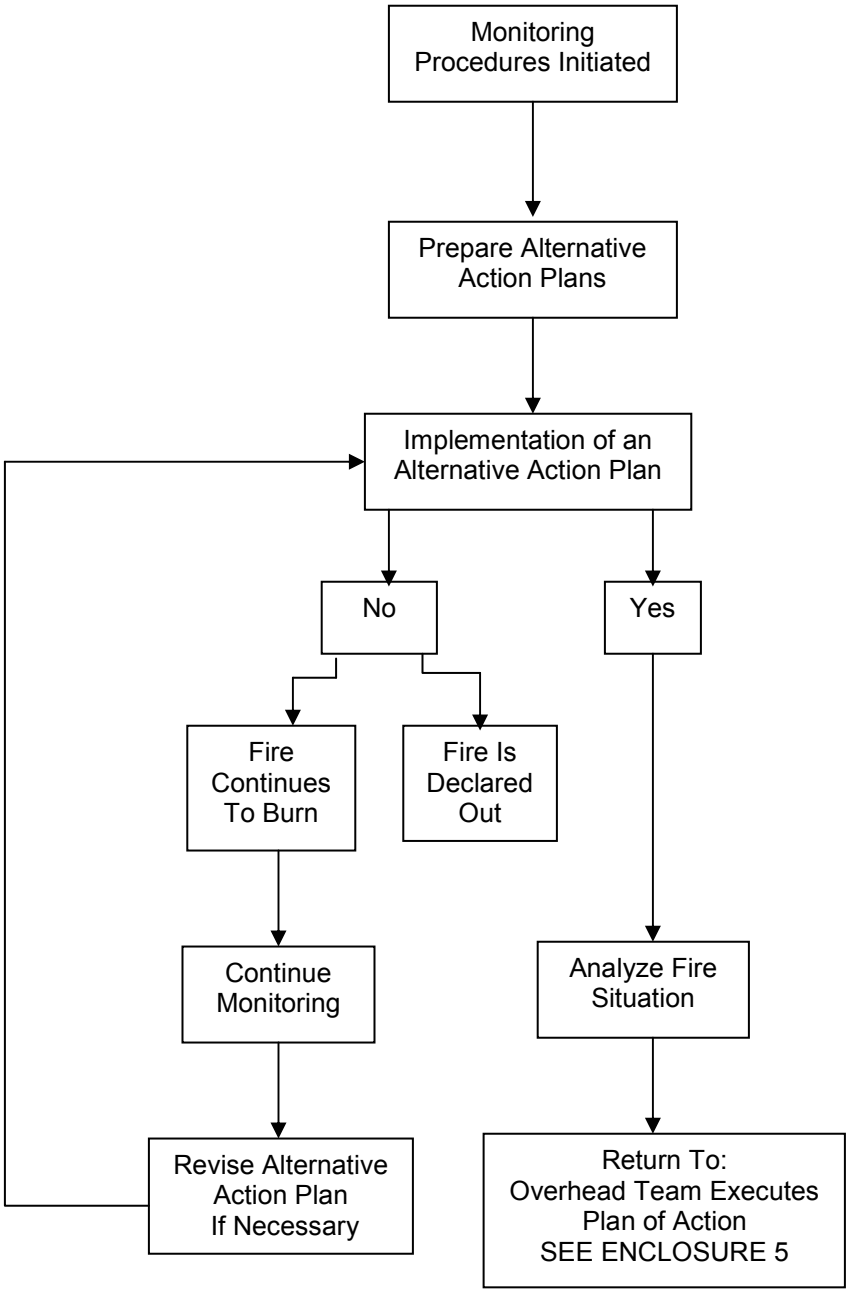
ENCLOSURE 5

KAWAILOA TRAINING AREA (KLOA)
OPERATIONAL DECISION CHART B
ESCAPE FIRE SITUATION



ENCLOSURE 6

KAWAILOA TRAINING AREA (KLOA)
OPERATIONAL DECISION CHART C
MONITORING PROCEDURES
(FIRES OUT OF CONTROL BEYOND KLOA BOUNDARY)



ENCLOSURE 7

25th ID(L) & USARHAW Reg 350-1

Request for Rotary Wing Aircraft Support

Date of Request:

REQUEST FOR ROTARY-WINGED AVIATION SUPPORT Proponent of this Form is G3, 25 ID(L) May 97		1. Late Request? Yes / No If Yes, Letter Incl? Yes / No
2. Requesting Unit:	3. POC and Ph# or Freq and Call Sign:	4. Submitted or Coord at AMAC/G3 Conf ?____ If Yes, Date:
5. Date(s) Required: 5a. Unit's Cycle:	6. Number and Type of Aircraft Requested: 1x UH 60	7. MSC or SEP BN S3 AIR:
8. Pick-Up Point(s)/PZ(s):	9. Destination(s)/LZ(s):	
10. Contact at PZ:	11. Contact at LZ:	
12. Pick-Up Time:	13. Release Time:	
14. Passengers:		
15. Cargo: (type, number, weight)		
16. Special Instructions or Mission Equipment: (e.g. Headphones, Cargo Hook, C2 A/C etc.)		
17. Mission Description: (who, what, when, where, why)		
18. Initial Planning Coordination: (when and where)		
AVIATION USE ONLY		
19. Mission Received From: (name, unit, date, time)		20. Mission Number
21. Mission Passed To: (name, unit, date, time)		
22. Mission Passed To: (name, unit, date, time)		
23. Mission Passed To: (name, unit, date, time)		
24. Number of Aircraft Assigned to Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
25. Estimated Number of Hours for Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
26. Remarks:		

ENCLOSURE 8

FIRE DANGER RATING SYSTEM (FDRS) FOR KLOA

FIRE DANGER RATING	BURNING INDEX	FLAME LENGTH (FT)	CAUTION TO BE EXERCISED	RESTRICTIONS	HAZARD
GREEN	0-30.9	0-11	Use Normal Caution	Conditions favorable for all training authorized at KLOA. Smoking is permitted.	LOW
RED	31+	11+	Use Extreme Caution	No smoking, or cooking/warming fires allowed. No Blanks.	HIGH

ENCLOSURE 9 WILDLAND FIRE INCIDENT REPORT

WILDLAND FIRE INCIDENT REPORT

25TH ID(L) & USARHAW

1. INSTALLATION	2. INCIDENT NUMBER (YY-000)

3. DATE (YYMMDD)	4. FIRE LOCATION (Grid Coordinates 6 digits only)	5. RANGE OCCUPIED BY UNIT
	EJ	

6. TIME FIRE REPORTED	7. TIME FIRE OUT	8. TIME RANGE OPS RESPONDED	9. TIME FIRST SFO AT SCENE

10. AGENCY NOTIFICATION (*If applicable*)	PHONE	TIME CALLED	AT SCENE	REMARKS
❑ FEDERAL FIRE DEPARTMENT	471-7117			
❑ G3/RDH WILDLAND PROGRAM MGR	286-5818			
❑ INSTALLATION OPS CENTER (IOC)	655-8763			
❑ RANGE OFFICER	655-1404			
❑ RANGE OPERATIONS SUPERVISOR	655-9509			
❑ DPW NATURAL RESOURCE MGR	656-2878			
❑ U.S. FISH & WILDLIFE SERVICE	541-3441			
❑ (Other)				
❑ (Other)				

11. FIRE DANGER RATING	BURN INDEX (BI)	15. FIRE ESCAPE ANALYSIS	CHECK ONE	
			YES	NO
❑ GREEN ❑ YELLOW ❑ RED	13. EST. ACRES BURNED?	15a. FIRE STARTED OUTSIDE FIREBREAK ROAD?		
	14. > 10 ACRES? (AAR)	15b. FIRE ESCAPED FIREBREAK ROAD?		

16. HELICOPTER SUPPORT	16b. Aircraft Call Sign	Tail No.	16c. Arrived On Scene	Departed
☐ UH-60 ☐ CH-53 ☐ CH-46 ☐ CH-47 ☐ OTHER				
16a. BUCKET SIZE (*BAMBI*) ☐ 240-Gal ☐ 660-Gal ☐ 2000-Gal ☐ Other				

17. FIRE CAUSE (*Narrative*)	18. AMMUNITION TYPE	19. WEAPON SYSTEM
	❑ Tracer ❑ Mortar ❑ Artillery ❑ HE / WP ❑ Pyrotechnics ❑ Grenade ❑ Demo / Mines ❑ Other	❑ AT-4 ❑ TOW ❑ SAW / M-16 ❑ SMAW ❑ LAW ❑ Rocket / Missile ❑ M240/M60 ❑ Other

20. TRAINING UNIT	21. UNIT OIC	22. TELEPHONE	23. AAR REQUIRED?

24. REMARKS
(Narrative)

25. FIRE REPORT COMPLETED BY:	DATE	26. FIRE REPORT REVIEWED BY:	DATE

WILDLAND FIRE INCIDENT REPORT FORM
GENERAL INSTRUCTIONS

PURPOSE AND USE: Used in the administration of the Wildland Fire Management Program. The purpose of this form is to document all wildfire incident(s) on Army training lands under the jurisdiction of the 25th ID(L) and USARHAW within the state of Hawaii. This form will also be used to document when Army assets respond to any wildland fire incident outside of its jurisdiction in support of mutual aid requests. Documentation of all wildfires is necessary to ensure accurate fire history and trend analysis to assist fire managers in future fire management planning. The form becomes part of the permanent record file for each Fire Management Area (FMA). Fire records may be kept on an automated computer database as part of long term land management records. n

DISPOSITION OF FILES: The maintenance and disposition of all wildland fire incident reports shall be in accordance with Army record management policy. Disposition: a) OCE: Destroy after 25 years in CFA. b) Other Offices: Destroy after 5 years.

PROPONENCY: The proponent of this form is the Installation Fire & Safety Office (IFSO). Action Officer is the Wildland Fire Program Manager.

COMPLETION INSTRUCTIONS

Item 1 - Enter appropriate name of military installation where the fire occurred.

Item 2 - Fill in incident number. Enter 2 digit calendar year followed by 3 digits in numbered in sequence for the number of fires occurred during that calendar year.

Item 3 - Enter date of incident. Year, month, day (YYMMDD).

Item 4 - Fire location. Enter 6-digit grid coordinates that indicate where the fire started. Provide 6-digits only in blocks provided. *(Right, then Up)*

Item 5 - Enter range, firing point, or maneuver area the training unit causing the fire occupied at the time the fire started.

Item 6 - Enter the time of day the fire was first reported to Range control.

Item 7 - Enter the time of day the fire was reported extinguished.

Item 8 - Enter the time of day the first Range control fire crew/unit responded to the fire location.

Item 9 - Enter the time of day the first Range control fire crew/unit arrived at the fire scene.

Item 10 - Notification. Enter the time of day that Range Control first notified each agency or individual listed and enter the time each agency or individual arrived at the fire scene.

Federal Fire Dept:	Must be notified of all fires.
Wildland Fire Mgr:	Must be notified of all fires.
Installation Ops Ctr:	Notified if helicopter support or additional fire assets are required.
Range Officer:	Notified of all major fires only.
Range Ops Supv:	Must be notified of all fires.
Natural Res Mgr:	Notified if fires are potential threat to T&E plant or animal species.
USFWS:	Must be notified of all fires that escape firebreak road or installation boundary.
Remarks:	Enter appropriate comments if any.

Item 11 - Enter daily Fire Danger Rating.

Item 12 - Enter current Burn Index (BI) at the time of the fire start.

Item 13 - Enter total estimated number of acres destroyed by fire.

Item 14 - Enter YES if fire area is greater than 10 acres. The training unit OIC must submit an After-Action-Report (AAR) if fire area exceeds 10 acres. OIC must complete the AAR before clearing the range.

Item 15 - Fire Escape Analysis.
15a. Check Yes or No if fires started outside firebreak road.
15b. Check Yes or No if fires escaped the firebreak road.

Item 16 - Helicopter Support. Enter type of aircraft used on fire.
16a. Enter fire bucket size used on fire.
16b. Enter aircraft call sign tail number. (i.e., Hillclimber 150)
16c. Enter time of day aircraft arrived on scene and time aircraft departed.

Item 17 - Fill in narrative form any information as to the cause of the fire, ignition sources, or item known to have started the fire. DO NOT speculate. Validate with training unit OIC. Conduct fire investigation as required.

Item 18 - Indicate ammunition type used that caused the fire.

Item 19 - Indicate weapon system used that caused the fire.

Item 20 - Enter name of training unit that caused the fire.

Item 21 - Enter name of the OIC responsible for the training unit.

Item 22 - Enter the telephone number of the OIC of the training unit where he may be contacted in the event additional information is required.

Item 23 - Indicate if an AAR is required. If yes, AAR must be completed by the unit OIC and submitted to Range control prior to release or range clearance.

Item 24 - Remarks. Enter appropriate comments pertaining to subject wildfire incident, if any.

Item 25 - Enter date and name of individual filling out the fire report.

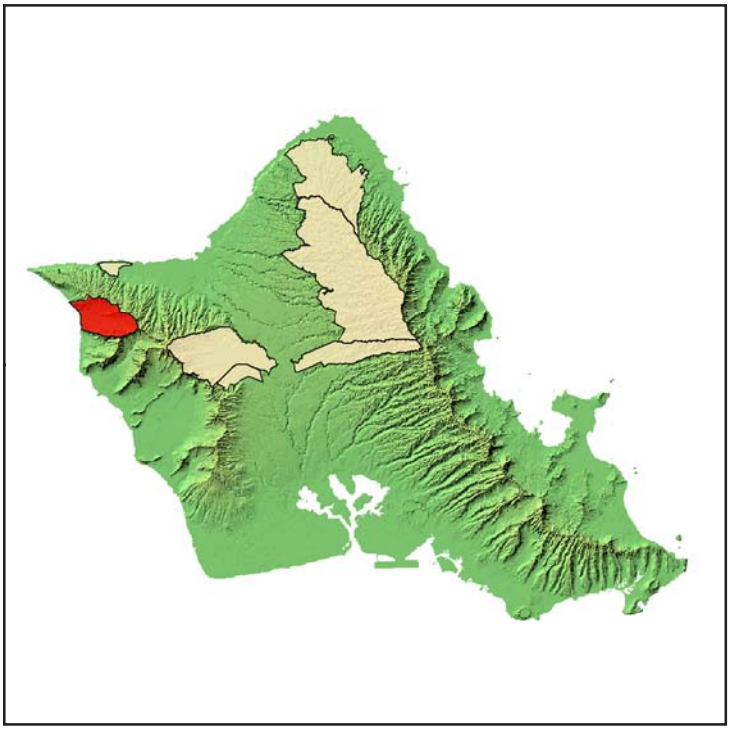
Item 26 - Enter date and name of the range supervisor reviewing the fire report. Range supervisor will review all fire incident reports for adequacy prior to submission to the wildland fire program manager.

FAX INSTRUCTIONS

A COPY OF ALL FIRE REPORTS WILL BE FAXED TO THE WILDLAND FIRE PROGRAM MANAGER WITHIN 24 HOURS AFTER THE FIRE INCIDENT IS REPORTED. ALL ORIGINAL WILDLAND FIRE INCIDENT REPORTS WILL BE MAINTAINED IN THE CURRENT FILE AREA OF EACH RESPECTIVE RANGE CONTROL OFFICE. A MAP MUST BE ATTACHED TO THE FIRE REPORT THAT IDENTIFIES AREAS BURNED.

MAKUA
MILITARY RESERVATION

STANDING OPERATING PROCEDURES



MAKUA MILITARY RESERVATION WILDFIRE SOP

1. GENERAL

1.1. Purpose.

The purpose of this Standing Operating Procedure (SOP) is to provide specific requirements that delineate the responsibilities of Federal fire department, Range Control personnel and using training units in the prevention and suppression of wildland fires at Makua Military Reservation. Its primary objective is to prevent unplanned ignitions through sound preventive measures. It also establishes procedures control fire and protect natural/cultural resources. See Figure MMR-1 for an overview.

1.2. Scope and Applicability. The provisions outlined in this SOP are applicable to all military training units and personnel assigned to or utilizing MMR. Unit commanders, regardless of service or component, whose unit(s) have been allocated use of MMR, will ensure compliance with this SOP. All officers, noncommissioned officers and civilian personnel will familiarize themselves with the contents of this SOP prior to use of the range facilities. Considering the adverse effects of wildfires, it is imperative that awareness on the part of all leaders is maintained and that all personnel are provided instruction in fire prevention and fire suppression. It is the intent of this SOP that the instructions and guidance contained herein are applied with a view towards accomplishing training goals with a minimum number of wildfires and limited damage to natural/cultural resources.

1.3. Responsibilities. In addition to the positions and responsibilities in the USARHAW Wildfire Management Program outlined in various sections, specific MMR responsibilities are as follows:

a. MMR Range Operations Supervisor, G3/DPTM, RDH. The Range Operations Supervisor shall ensure that all fire protection measures/resources are available, properly staged, and in operational condition prior to initiating any training activities. This includes minimum staffing, fire response vehicles, fire cache equipment, helicopters (on-site and standby), serviceable fire buckets, and filled dip ponds, as identified in the requirements of the IWFMP and this SOP.

b. Installation Commander. The Installation Commander has the overall responsibility for fire prevention and protection requirements and environmental management at KLOA.

c. Director of Installation Fire and Safety Office. The Director of Installation Fire and Safety has overall responsibility for the wildland fire management program.

d. Fire Chief, Federal Fire Department (FFD). The installation Fire Chief is responsible for the organization, supervision, and management of all aspects of the fire prevention and protection program in accordance with the provisions of DoDI 6055.6, Fire Protection.

d. Range Officer, G3/DPTM, Range Division Hawaii. The Range Officer has overall responsibility for enforcing the provisions of the Integrated Wildland Fire Management Plan (IWFMP) and other applicable training directives and regulations, including restrictions on or cessation of training activities based on the fire danger rating.

e. Range Operations Supervisor, Schofield Barracks. The SB Range Operations Supervisor is responsible to the Installation Commander for ensuring proper fire prevention measures are taken by troops in rear areas; fires in forested and other training areas, when discovered, are promptly reported; and augmenting the Federal Fire Department in fighting any fires at MMR.

f. Wildland Fire Program Manager, IFSO. The Wildland Fire Program Manager is responsible for the execution of the Army's wildland fire program. Collaborates with other resource managers, FFD and other cooperative fire agencies to ensure that supplies, equipment, training, and qualified personnel are available to meet the goals and objectives of the IWFMP.

g. Unit Commanders and Division Chiefs. Commanders, managers, and supervisors at all levels of the organization are responsible for ensuring unit personnel are familiar with and comply with the provisions of this SOP and applicable regulations, fire prevention restrictions, training activities within biologically sensitive areas, and providing qualified personnel to support the wildland fire management program.

h. RDH MMR staff (Range Control) has the responsibility of enforcing all the provisions of this SOP and IWFMP.

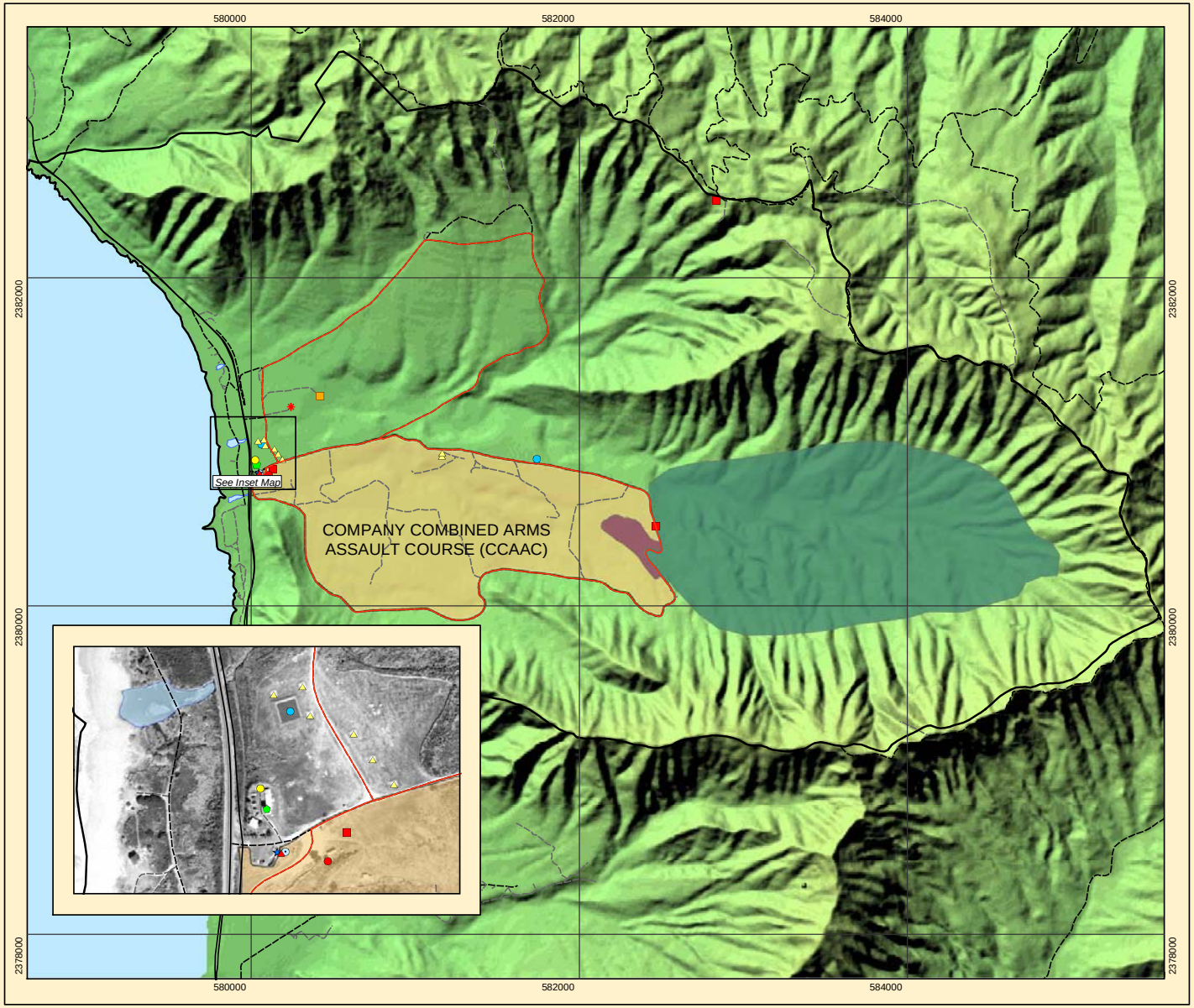
i. Fire prevention is the responsibility of every soldier, contractor, and any other person working or training at MMR.

1.4. Environmental Considerations.

a. As outlined in Chapter 7.2. of the IWFMP, wildfires pose significant risks to threatened and endangered species of plants and animals and their native habitat at MMR. These habitats are found outside the firebreak road and mostly along the high valley walls and on the ridgelines of the installation (Figure MMR-2). Wildfires can burn within the firebreak road without causing a threat to sensitive habitat in Biological Sensitive Areas (BSA). However, due to the absence of other control barriers, and the presence of Unexploded Ordnance (UXO) outside the firebreak, fires outside the firebreak are considered critical. While wildfires in MMR are normally confined to alien grasses, each time a wildfire burns against the native forest, a portion of the habitat may be burned. With repetition over the years, the native forest is moved back and replaced with alien grasses. This has caused a gradual retreat of the native forest.

b. Cultural resources, including known archeological sites, are also found within the range complex. Unlike the natural resources, these are located within the firebreak road. Most of these sites have been burned or changed by some other process sometime in the past. However, wildfire suppression still threatens archaeological sites at MMR. Suppression techniques such as unmonitored carelessly constructed bulldozer lines, off road driving of fire apparatus, vehicles, and other ground fire suppression measures can damage cultural resources.

c. Because of the above concerns, fire management in MMR is a sensitive issue. All personnel working or training at MMR for any reason will adhere to the requirements, procedures, and precautions set forth herein.



Makua Military Reservation

Fire Suppression Resource Locations

Figure MMR - 1

Legend

- Installation Boundary
- Training Areas

ICM Areas

- Non-Waiver
- Waiver Area

- Ammo Storage Point
- Dip Pond
- Fire Cache
- Fire Pump
- Hummer
- Firing Point
- Helipads
- Remote Auto Weather Station
- Water Tank
- Water Tender
- Wet Standpipe System
- Firebreak
- Surface Water Body

Roads

- Primary
- Tertiary
- Unimproved

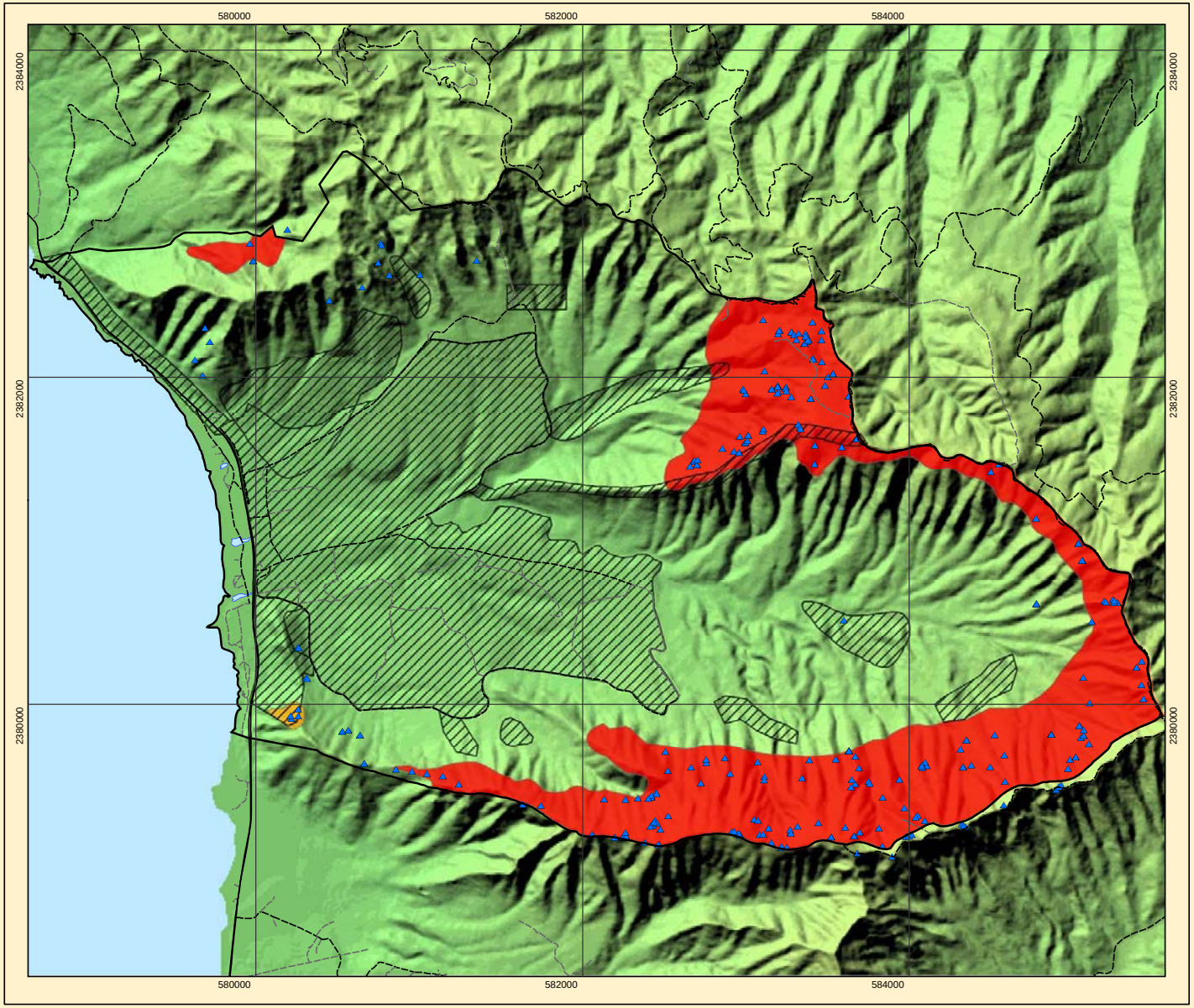
N

1:25,068

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: USARHAW IFSO



Makua Military Reservation
Protected Resources

Figure MMR - 2

Legend

Biological Sensitive Areas

- BSA-1
- BSA-2
- Sensitive Archeological Areas
- Federally Listed Species
- Installation Boundary
- Surface Water Body

Roads

- Primary
- Tertiary
- Unimproved

N

1:25,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.

USAG HI DPW 2003.

2. FIRE PREVENTION.

One of the primary objectives of this SOP is to integrate fire management actions with military training requirements and range operations. The prevention of fires is the responsibility of every individual training and/or working at MMR. Fire prevention is critical for the continued survival of endangered plants, animals and native ecosystems, and the Army's continued use of the area as a live-fire range. Currently, there are many instance where military operations conflict with the management of these special natural resources. These conflicts often result in reduced training capability as "WILDLAND FIRES STOPS TRAINING". Fire management actions are designed to reduce existing conflicts between necessary military training activities and the conservation of natural and cultural resources found within KLOA.

2.1. Education

a. Soldiers will be briefed prior to training about fire prevention, and cultural and natural resource protection. The fire prevention briefing ensures that important information is provided to using individuals that may start wildfires.

b. Signs will be posted throughout various areas as reminders of prevention and awareness of the Fire Danger Rating System (FDRS).

c. Fire prevention and environmental pocket cards will be issued to users to increase individual's awareness of fire and environmental issues.

2.2. Enforcement.

a. The primary responsibility for enforcement of range directives falls on Range Control.

b. Secondary responsibility rests with the using unit commanders.

c. Failure to follow range protocols will result in termination of scheduled training and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

2.3. Engineering. There are no plans for additional firebreaks at MMR at this time.

2.4. Ignition Control.

a. All training will be subject to the fire danger rating system (see Section 3.1 and Enclosure 4 of this SOP).

b. Fuels management as described in Section 7.5.5 of the IWFMP will be implemented in part to reduce the chance of ignition.

3. PRE-SUPPRESSION ACTIONS.

3.1. Fire Danger Rating System (FDRS).

a. Range control will be responsible for retrieving weather data from the MMR RAWS and archiving it into the "WeatherPro" software program. The BI, as determined by the NFDRS, will be used to rank fire danger based on known ignition sources.

b. The BI's will be monitored every hour, on the hour, and prior to projected "hot" range status. Range control will notify the training unit every hour, and on the hour, of any training restrictions being imposed as a result of unfavorable fire danger ratings. Additionally, at any time that the BI changes from one category to another, the training unit will be notified.

c. Hourly fire danger ratings will be posted on the wallboard in the Range Control office. This data will be used as the basis for making decisions concerning limiting the use of selected weapon systems or ammunition.

d. While training at MMR, units must use caution during training exercises. Soldiers must be aware of and adhere to fire danger-rating restrictions of incendiary ammunition, pyrotechnics, smoking, and other ignition sources (see Enclosure 8). Strict compliance with training restrictions set forth herein will reduce the number of fire starts. The FDRS for MMR is as follows:

Flame Length (ft)	***Burning Index***	***Fire Index Color***
0-6	0-20.9	Green
6-11	21-47.9	Yellow
11+	48+	Red

e. OIC's in charge of training will allow training to commence only after ascertaining that the training restrictions are in effect and adopting the appropriate fire prevention measures.

f. Tracers are currently prohibited at MMR. See Enclosure 8 of this SOP for a full list of FDRS restrictions.

3.2. Minimum Staffing Requirements.

a. MMR Staff.

(1) Proper staffing of MMR Range Control operations requires a minimum of five trained firefighters during any scheduled live-fire training operation. This requirement is based on the safety and complexity of the fire fighting organization during initial attack operations. These individuals can be assigned other RDH duties until a fire is reported. During a fire operation, one individual will stay with the radios/telephones (radio dispatcher), one will supervise the entire operation and the 20-man detail from the training unit, while the other three individuals man the HUMMER Brush Engine and Water Tender.

(2) The Range Officer and MMR Range Operations Supervisor will arrange work schedules to allow flexibility while ensuring that minimum staffing levels are met to include overtime authorizations. In the event of a wildfire, fire fighting duties take precedence over other work assignments.

b. Military Training Unit.

(1) The training unit will augment the MMR staff with a twenty man wildfire suppression detail, consisting of personnel present at the range. These personnel must be immediately available to the MMR staff should a fire start for any reason. One of the individuals will be a NCO to provide unit supervision of the detail.

(2) The unit OIC is responsible for submitting a twenty man fire fighting detail roster to Range Control. Personnel will be identified and trained in proper use of the fire equipment prior to live-fire commencing. Range control will be responsible for issuing all Personal Protection Equipment (PPE) and fire suppression equipment to training units for fighting fires.

(3) A trained wildland firefighter or crew boss will provide direct supervision of the twenty-man detail.

c. Helicopter Unit.

(1) One helicopter aircrew, trained in aerial fire bucket for wildland fire operations, will be on site at MMR during any live-fire training exercises. The number of aircraft crew members is determined by the minimum crew for the specific aircraft being used.

(2) The aircrew shall remain in an alert status and located in the Range Control building. Upon notification of a fire, the aircrew shall respond immediately as part of the initial attack response.

(3) The second standby aircraft will be on station at the airfield that supports the first aircraft. Upon notification of a fire at MMR, this aircraft must be capable of responding to MMR within one-hour.

3.3. Training.

a. MMR staff. Of the five minimum individuals: The two manning the HUMMER Brush Engine must be trained at the Firefighter Training (FFT) 1/2 level. The one person acting as the fire supervisor must be trained at FFT1/2 and Crew Boss Single Resource (CRWB) level. The dispatcher may be in training for FFT, but still must have a MMR fire orientation by the MMR Range Operations Supervisor.

b. Individuals will not be assigned to duties for which they lack training and/or certified experience. All Range Control personnel dispatched or assigned to wildfires or prescribed fires will be qualified for the fire position assigned, unless assigned as trainees and under direct supervision of higher qualified personnel at all times.

c. The 20-man detail must have an equipment familiarization and one hour fire suppression orientation by the MMR staff prior to assuming duties. This course is intended to provide basic safety and fire skills necessary to assist the MMR staff with fire suppression.

c. Aircrews must have completed a unit aerial fire bucket orientation class/course with qualifications established by the unit (See Section 5.7, Aviation Plan).

3.4. Fire Equipment and Supplies. If at any time the required fire suppression equipment is not operational, fire suppression personnel are not present, or aerial fire buckets are not operating properly, live-fire training will be suspended until all equipment is operational again. Live-fire training will only be conducted when fully trained/certified personnel and functioning equipment is readily available for fire suppression.

a. Fire Cache Supplies.

(1) Range control personnel will maintain a forty firefighter cache of fire equipment in a constant state of readiness. The cache will contain a supply of:

(1) Fire hand tools

(2) Chain saws

(3) Pumps

(4) Forestry hose

(5) Class A foam concentrate

(6) Hose appliances

(7) PPE. The fire cache shall be equipped to outfit firefighters with appropriate PPE.

(8) Portable radios

(9) Aerial fire buckets

(10) Foam proportioner units (vehicle and aircraft)

b. The MMR Range Operation Supervisor and the Wildland Fire Program Manager will conduct periodic checks to ensure all resources are in place and will identify and immediately correct any deficiencies.

c. Range control shall be responsible to coordinate with the Wildland Fire Program Manager for replacement of equipment.

3.5. Personal Protective Equipment (PPE).

a. All fire fighting personnel assigned to MMR must be issued proper PPE necessary for fighting wildfires (See Reference 4.2.2 of the IWFMP). Fire fighting personnel will ensure that proper PPE is worn at all times when on the fireline or in the fire area. Personal safety and prevention of injuries is the first priority in every fire management activity.

b. To ensure operational readiness during live-fire training operations, MMR staff personnel designated to fill the mandatory fire positions will be required to wear Nomex pants and leather boots as part of their daily attire while training is being conducted. This action will prevent delays and enhance response times to fire incidents at MMR.

c. PPE for the 20-man detail from the training units, or other auxiliary response personnel, will be issued from the MMR fire cache supplies.

3.6. Fire Vehicles.

a. One operational HUMMER Brush Engine, equipped with 300 gallon slip-on pump unit (Class A foam capable) and one 6x6 Water Tender (1200-gallon capacity) shall be on site and assigned for initial attack response at MMR.

b. Range control personnel operating fire response vehicles must be qualified firefighters (FFT 1/2) licensed to operate the vehicle. The Wildland Fire Program Manager shall monitor vehicle qualification and training program for Range Control staff.

c. Range control personnel will perform daily preventive maintenance inspections of vehicles and equipment to ensure operational readiness. All discrepancies shall be identified and annotated on DA Form 2404, Vehicle Discrepancy Inspection Checklist. The MMR Range Operations Supervisor will review all 2404's and coordinate maintenance and repairs with the Wildland Fire Program Manager.

d. Back-up and extended attack vehicles:

(1) One operational HUMMER Brush Engine equipped with a 300 gallon slip-on unit (Class A foam capable) will be on standby at MMR for back-up or use during extended attack. If the one mandatory HUMMER Brush Engine is not operational, and this back-up is not available, training will cease until another engine can be brought on site.

(2) If the Water Tender is not operational then another Tender or two HUMMERS with slip-on units must be at MMR.

e. There are several refill locations at which HUMMERS and Water Tenders may refill.

(1) Two 300,000 gallon dip ponds, one near the Range Control building, the other near objective Deeds.

(2) Two freshwater standpipes at the Range Control building.

3.7. Helicopter Fire Bucket Support.

a. During the initial scheduling and coordination for the use of MMR, the using training unit must arrange for a dedicated primary and a standby helicopter support for aerial fire bucket operations. No live-fire will occur until a utility helicopter and trained aircrew is on station at MMR for aerial fire bucket operations. See Section 5.7 of the IWFMP for general aviation requirements.

b. There is a requirement for two aircraft, with all aircrews trained in aerial fire bucket operations, dedicated to support wildfire suppression operations at MMR.

(1) One utility aircraft, with an aircrew trained in aerial bucket operations will be dedicated to the initial attack and must be physically on site at the helicopter parking area in front of the MMR Range Control building. This aircraft must be parked with bucket hooked up (and already tested) before any training using pyrotechnics, including blank ammunition, or live-fire training

commences. The aircrew shall be located at the Range Control building on alert status and respond within 10-15 minutes upon detection of a wildfire at MMR.

(2) Second standby aircraft, identified as the back-up for wildfire suppression mission at MMR, will be on station at the airfield that supports the first aircraft (Wheeler AAF or Kaneohe MCBH). This aircraft must be preflight/run-up, with aircrew ready to respond immediately upon notification of a fire, and respond to MMR within 1 hour. This aircraft is intended to be a back-up to the first aircraft in case of an extended attack, mechanical failure, or to relieve the MMR aircraft on site should a fire continue beyond the flight time capability of the initial aircraft.

c. At no time will the dedicated helicopter depart MMR without notifying the MMR staff. If a helicopter is to depart the range, live-fire training will be suspended and the area visually checked for fires prior to its departure.

d. MMR staff is responsible to ensure that a serviceable primary and a reserve BAMBI fire bucket is available for use at all times. Upon arrival of the assigned helicopter at MMR the staff will assist the aircrew in attaching the control head unit to the helicopter's pendant cargo hook and confirm that the fire bucket is fully operational.

e. The helicopter crew will conduct two successful fire bucket operation test drops prior to the firing of any live ammunition or pyrotechnic training. A successful test drop is defined as the ability to submerge the fire bucket in the dip pond, filling water to its capacity, lifting the fire bucket out of the dip pond, maintaining hover over the dip pond to check for leaks (15 seconds), and activating release dump while dispersing the water back into the dip pond. If a fire bucket is not operational, a replacement fire bucket will be obtained and tested. Training will not commence until a serviceable fire bucket is operating properly. The MMR staff will immediately note all discrepancies and status of inoperable fire buckets and report them to the Wildland Fire Program Manager to coordinate immediate replacement or repair.

f. Air-to-ground radio communication must be established between the aircraft, Range Control, the IC, and other units involved in fire suppression activities. Coordination and direction of air resources with ground fire fighting crews is essential for safe and effective application. Range control and fire crews will use the MMR Range Control frequencies and air-to-ground portable radios to communicate with the aircrew when directing initial attack fire bucket operations. Radio frequency is VHF 123.975 MHz (Primary) and FM 38.30 (Secondary).

g. Water locations.

(1) There are two 300,000 dip ponds at MMR. One is located 200 meters to the northeast of the Range Control building (Makua Lower Dip Pond #1) and other dip pond is located 2000 meters down range (east) along the fuelbreak road (Makua Upper Dip Pond #2).

(2) If the dip ponds should be emptied as a result of extended attack operations, salt water from the ocean may be substituted.

(3) MMR staff will ensure that the upper and lower dip ponds are filled at a minimum of 75% (above the 7-foot mark) of its maximum capacity prior to any live-fire training. The lower dip pond #1 is filled using the waterline into MMR. The upper dip pond #2 has no water line and can only be filled by water tender delivering water from another off site location. The Wildland Fire Program Manager will be notified immediately to coordinate service contracts as necessary

to repair or refill the upper dip pond in the event the water level falls below the minimum water capacity required.

3.8. Other Resources. For a complete listing of other resources that can be made available for MMR, see Section 2.4 of the IWFMP.

4. FIRE SUPPRESSION ACTIONS.

4.1. Fire Reporting and Notification Procedures.

a. Early fire detection and prompt reporting is critical for effective initial attack of wildfires on MMR. All fires, regardless of size, will be reported immediately to Range Control and in turn, to the FFD. Units will follow the fire reporting procedures below:

a. Upon detection of a fire, the unit Officer in Charge (OIC) will immediately initiate a “cease fire” order and notify Range Control, giving the location and size of the fire. The unit OIC will immediately place himself and all unit personnel under the operational control of the MMR staff or IC for fire fighting operations.

b. A unit that discovers or causes a fire will immediately take adequate measures to contain or extinguish small fires within the immediate vicinity. The primary mission of the unit commanders will shift from training objectives to fire control.

c. All training is suspended immediately when a fire is discovered. Training will remain suspended until the IC or MMR Range Operations Supervisor determines that the fire is extinguished.

d. Failure to notify Range Control of any fire will result in termination of scheduled training and responsible individuals may be subjected to administrative disciplinary action in accordance with applicable regulations. Personal fines may also be issued by outside regulatory agencies, if an investigation determines that negligence caused unwarranted damages to protected resources.

e. The MMR radio dispatcher will immediately mobilize the MMR wildfire ground crews and the helicopter aircrew on alert status at MMR. The dispatcher will also notify the Schofield Barracks Range Control and the Federal Fire Department (FFD). The FFD will dispatch the Area 2, Assistant Fire Chief and a fire company from Fire Station 11, Lualualei and/or additional fire fighting units, if warranted.

f. The MMR Range Control will immediately notify the Installation Operations Center (IOC) upon determination by the MMR Range Operation Supervisor, the IC, or FFD that a potential extended attack exists and that the second standby helicopter and/or additional fire fighting support is required.

g. Other personnel or agencies will be notified, time permitting. Notification of the using unit’s higher headquarters is the responsibility of the using unit.

h. If the fire has escaped the firebreak road system, the MMR staff will immediately contact the DPW Environmental Division, Conservation staff. If the fire has escaped the firebreak and is

threatening BSAs, and the MMR staff cannot contact the DPW Environmental Division office, the MMR staff will immediately contact the USFWS directly.

i. If a fire has started outside the firebreak road, training will be suspended until an internal investigation has been completed and the DPW Environmental Office has conducted a survey of the fire area. The DPW Environmental Office will reinitiate consultation with the USFWS before any training is allowed to resume. This consultation with the USFWS may take several days or weeks.

j. In the event Range Control becomes aware of a fire that has started outside of MMR, or a fire on MMR is moving out of the MMR boundary, Range Control will immediately call 911 for the City and County of Honolulu Fire Department (HFD). Fires started outside the MMR installation is the responsibility of HFD. The MMR staff will respond to confirm exact location of that fire and monitor the fire's progress. If a fire situation off MMR presents imminent threat to MMR, Range Control will implement notification and fire response procedures as outlined in this SOP. Range control personnel will position available fire fighting resources to assist in controlling the fires and to prevent fires from coming onto MMR.

k. Immediate notification of RDH or FFD supervisors must be initiated to request additional personnel or overtime, or to recall additional qualified wildland fire personnel, in the event minimum staffing is inadequate.

4.2. Initial Attack.

a. Immediate, and aggressive response to all fires is an unconditional requirement for MMR. The high values of the natural and cultural recourses in MMR justify the fullest commitment, within the confines of personnel safety, to expeditious containment and control of all fires. The difficult and often hazardous fire conditions warrant total initial attack effort to arrest fires in the early stages. In reality, the savings to be realized from a successful initial attack will offset the cost of many so called "over reactions".

b. A unit that discovers or causes a fire will immediately cease its operations or training, notify MMR Range Control, and take adequate measures to contain or extinguish small fires within the immediate vicinity. The primary mission of the unit commanders will shift from training objectives to fire control.

c. The HUMMER Brush Engine will immediately proceed to the scene of the fire. The standby helicopter will be launched as required. An IA Crew Boss will respond and organize and equip the 20-man detail from the training unit. The MMR dispatcher will start notifications.

d. Upon arrival at the site, MMR Range Control IA Crew Boss will assess the fire conditions and determine fire control equipment and personnel requirements necessary to execute initial attack operations. At this time, the fire will be evaluated. Definitions for evaluation are:

(1) ROUTINE Wildfires. Wildland fires that are within the firebreak and can be handled by the MMR staff, the standby helicopter and the 20 man detail (on site IA resources only, no threat to BSA).

(2) SERIOUS Wildfires. Large wildland fires that are within the firebreak or any fire that may escape the firebreak and/or may require the assistance of additional off site assets. The FFD and the Wildland Fire Program Manager will respond and additional resources may be

alerted but not used. (Off site IA resources may be required, fire may be outside the firebreak but not yet seen as threatening BSA at this time).

(3) CRITICAL Wildfires. Wildland fires that have escaped the firebreak and will require off site resources and possibly assistance of mutual aid and pose a critical threat to loss of high value resources and/or potentially may leave the MMR installation boundary. (Off site IA or Extended Attack resources required, fire is outside the firebreak and is threatening BSA).

e. In the event fire escapes the initial attack, the IC will implement an extended attack plan or fire escape contingency plan. (Refer to Enclosure 4, 5, and 6, Operational Decision Charts, of this SOP).

f. The IC will coordinate with the MMR staff for requesting military assistance for combating major fires.

g. Fires in the UXO high hazard area with potential for escape and/or fires that have potential to carry fire into high resource value areas (BSA) on MMR justify the fullest commitment to aggressive containment and control of fires. The Army shall notify adjacent landowners before the fire escapes the MMR boundary.

h. Due to the possibility of UXOs, under no circumstances will firefighters or troops enter a high hazard impact area to fight a fire. Aerial fire bucket operations will be utilized to control fire in contaminated areas that are inaccessible by ground fire fighting teams.

i. Attack Methods.

(1). Types of Attack.

i. Direct Attack. Direct attack is the use of manpower to directly fight a fire, on a fireline at the fire itself. Direct initial attack by trained MMR staff assisted by the using unit twenty man detail at the onset can suppress fires at the point of origin or prevent fires from spreading. However, fuel loads, UXO, and terrain conditions outside of the fire/fuelbreaks at MMR currently limit safe and effective direct attack by fire crews in much of the area. Ground fire fighting hand crews or brush engines can be effective for containing, or at least retarding the spread of fires until water/retardant drops from helicopters can be used. Direct attack with helicopter water drops can be very effective. Aerial fire bucket operations will be utilized to control fire in areas that are inaccessible by ground fire fighting teams.

ii. Indirect Attack. Indirect attack is the use of ground crews or aircraft to create control lines in front of fires before the fire arrives. In areas with UXOs or heavier fuel loads, indirect attack incorporating offset hand lines roads and pre-constructed firebreaks can be used as an approach. Unless conditions of the particular incident determine otherwise, fuel within compartments isolated by barriers or control lines should be expeditiously back fired (burned out to cause fuel starvation) to reduce chances of fire escape.

(2) Recommendation for suppression within the firebreaks. The direct attack method is considered the best method within firebreaks. Hand crews, brush engines and aerial buckets can be used in this area. Since it is desired to suppress a fire a quickly as possible using crews with hand tools and engines/buckets with water/foam directly on a fireline is recommended. Black lines/backfiring can also be used as a control measure for fuel starvation. Due to the rough terrain and the presence of cultural sites, bulldozer lines are considered a last resort and

should be only sited (unless used to clear old paths) with the recommendation of the DPW Environmental Division. However, several internal access roads reduce the necessity to cut tractor lines. The firebreaks and these internal access roads provide excellent control lines to black line/backfire off of. The HUMMER Brush Engine can maneuver on all of these roads. The 6x6 Water Tender and other Type 50/60 Brush Engines should stay on the firebreak road. Structural engines/tenders should only be allowed on the center firebreak road as far as the upper dip pond #2. Several Escape/Safety zones can be designated along the firebreaks, in mowed areas, and in previously burned areas.

(3) Recommendation for suppression outside the firebreaks. Both the direct attack and indirect attack method can be used outside the firebreaks. Hand crews and brush engines can only be used in areas along the firebreaks and a few access roads along the north firebreak. Personnel are not to leave these roads due to the presence of UXOs. The desire to suppress a fire is subordinate to personnel safety. Use of aerial buckets with water/foam directly on a fireline or indirectly to establish foam or retardant lines in front of, or around a fire, is recommended. Black lines/backfiring should only be used as a last resort and only with a control line. Due to the rough terrain and the presence of UXOs, bulldozer lines are not normally practical and should be considered as a last resort and should only be sited with the use of Explosive Ordnance Disposal personnel. There is one jeep trail access road on the north rim of MMR. The Air Force and the State DOFAW controls the access to this trail. This trail offers the only established control lines to black line/backfire off of along any perimeter of MMR. There are a few helicopter landing sites along the central (east) rim of the valley. These spots have been used to fly in hand crews to establish hand lines. Caution should be exercised in determining escape routes and safety zone prior to employing crews in these areas. During an extended attack, DPW Environmental Division personnel can assist with establishing protection priorities.

4.3. Command and Control.

a. Upon notification of a fire by the training unit, the MMR Range Control staff will immediately close the range for any other operation except for fire suppression resources responding down range.

b. A trained MMR staff wildland fire Crew Boss will immediately proceed to the scene of the fire and assume command and control of all fire fighting activities.

c. The unit OIC will direct any unit fire suppression actions until relieved by the arriving MMR Initial Attack (IA) Crew Boss. Command and control of the fire incident will be extended to the MMR Range Operations Supervisor, the Wildland Fire Program Manager, or the Senior Fire Officer (SFO) of the FFD as the incident commander (IC).

d. Implementing the Incident Command System (ICS) designates the highest trained individual as the IC.

e. The IC will establish a command post when it is anticipated the fire incident is of a serious or critical nature.

f. The IC will initiate action requesting mutual aid support from other fire agencies in accordance with established Cooperative Agreements, if required.

g. The use of military personnel will only be authorized under controlled circumstances. When utilized, military personnel will be under the direct supervision and control of a qualified wildland firefighter from the RDH staff or the FFD.

h. Once resources have been committed to fire fighting, they are under the operational control of the IC. The IC directs the overall employment of fire fighting resources to contain and extinguish the fire. This does not preclude unit commanders from rotating personnel and equipment as necessary. The IC will release fire fighting resources only after determination that they are no longer required.

5. POST- FIRE ACTIONS.

5.1. Records and Fire Reports.

a. General wildfire reporting is covered in Chapter 6.1. of the IWFMP.

(1). MMR Range Control personnel will maintain a log of actions during all fires on DA Form 1594, Daily Staff Journal or Duty Officer's Log. All fire incidents will also be assigned a fire number and officially recorded on the standard Fire Incident Report form for all Army training lands. A sample Wildland Fire Incident Report (WFIR) form is included at Enclosure 8 of this SOP.

(2) The MMR Range Operations Supervisor will review all fire reports for accuracy and proper completion of the Fire Incident Report. A copy of each report will be faxed to the Wildland Fire Program Manager and the DPW Environmental Division at the earliest opportunity. DPW Environmental Division will forward copies of all fire incident reports of fires that escape outside the fire/fuelbreak road to USFWS.

(3) Fire records will be kept on an automated computer database and maintained by the Wildland Fire Program Manager necessary for fire history and fire trend analysis. The Wildland Fire Program Manager and DPW Environmental Division will coordinate submission of semi-annual MMR WFIR's to USFWS NLT 10 July and 10 January of each calendar year.

c. It is important that all fire incidents are documented to ensure that accurate fire history of all fires at MMR is maintained. Fire reports are used for fire trend analysis on location, size, cause, frequency, and use in Geographical Information System (GIS). If available, a Global Positioning System (GPS) should be used to plot burn areas.

5.2. Surveys.

a. In addition to the reports and reviews that are done immediately after a wildfire, a post-fire analysis survey of the burned area may be required depending on the fire's location and vegetation damaged. The post-fire analysis may be combined with any of the informal or formal investigations. A post-fire analysis will need to determine either all or part of the following:

(1) The affect the fire may have had on native or alien natural flora and fauna resources and cultural resources.

(2) The effectiveness of the pre-suppression measures including fuels modifications.

(3) The effectiveness of the suppression resources and measures used.

(4) The effectiveness of the ICS.

(5) The effectiveness of fire/fuel models used.

(6) A safety review of suppression actions.

(7) A UXO contamination survey or potential UXO clean up operations.

b. A post- fire survey of the fire area will be conducted with the coordination of the DPW Environmental and ITAM office.

c. The effects of fire on threatened and endangered species or effects from catastrophic fire events must be surveyed at the earliest opportunity.

d. If during the survey it becomes evident that a wildfire has occurred outside the perimeter of the firebreak and/or affected a BSA/SEA, or threatened any endangered species, the USFWS and the State of Hawaii DOFAW will be notified. If the wildfire was determined to be caused by military activities then the Army will reinitiate Section 7 consultation under the ESA.

e. If a UXO survey or clearing operation is desired, then coordination with the Explosive Ordnance Disposal (EOD) unit is necessary. Surveys or clearing operations must be planned, coordinated, and should be carried out immediately after a fire.

5.3. Investigations and Accident Reporting.

a. After Action Reports (AAR) will be conducted for fires of four hectares (ten acres) or more and/or during which unusual events occurred, including failure to follow instructions.

b. The RDH will request a formal investigation for fires involving any of the following:

(1) Training related caused fires escaping or starting outside the MMR boundary.

(2) Damage or loss of valuable property exceeding $1000.00.

(3) Damage of loss to Biological Sensitive Area (BSA) or incidental take of plant or animal specie.

(4) All entrapments of fire shelter deployments.

(5) Major injury or fire fatality.

MAKUA MILITARY RESERVATION WILDFIRE SOP

ENCLOSURE 1 FIRE PREVENTION BRIEFING

The following verbiage will be included in a general safety, environmental and fire prevention briefing to be given to all personnel before training at MMR.

The purpose of this brief is to educate users of the range about the dangers of fire on the range. Fire prevention is the responsibility of every person working or training on the range. There are several reasons that fire prevention is so important. Fire poses a grave threat to endangered plants and animals at MMR. Fires also pose a danger of damage to archaeological sites. If a fire starts, all training must cease, and training downtime will result. For these reasons, every effort must be made to prevent range fires. In order to prevent fires, you must follow the following rules:

1. No lighted tobacco smoking materials will be discarded on the range. Smoking on the ranges is prohibited except in the designated smoking areas at the bivouac area of MMR.

2. Open fires are not authorized.

3. Heat tabs and similar commercial products must be used inside metal containers.

4. The use of smoke grenades or simulators is authorized, but must be used in such a manner that will not cause fires to ignite. This means do not place smoke grenades or simulators in vegetated areas. Place them in the dirt or in metal cans provided by Range Control. Units are required to use metal barrels provided by Range Control in which to place grenades.

5. White Phosphorus or aerial pyrotechnics are not authorized under any circumstances in MMR.

In the event a fire is started, cease training immediately. Range Control must be notified immediately. Every safe effort must be made to put the fire out, and to do so as quickly as possible. Every resource available on the Range must be committed to this effort. These resources include the helicopter with fire bucket, HUMMER Brush Engine fire trucks, and those of you that have been designated as part of the fire fighting team. Your unit leaders will advise you if you are on this team. In the event this fire fighting team is required, a trained safety technician will direct your work to put the fire out. The fire fighting team must be knowledgeable of safety and the proper use of backpacks and hand tools for fire fighting. When needed, this fire equipment will be issued at a site near the weather station. (Demonstrate the use of water backpack and fire swatter). Water for fire fighting is available in the two dip ponds on the range. One north of the operations building, and the other is located near objective deeds. Additional water is available from the large blue tank near the tower.

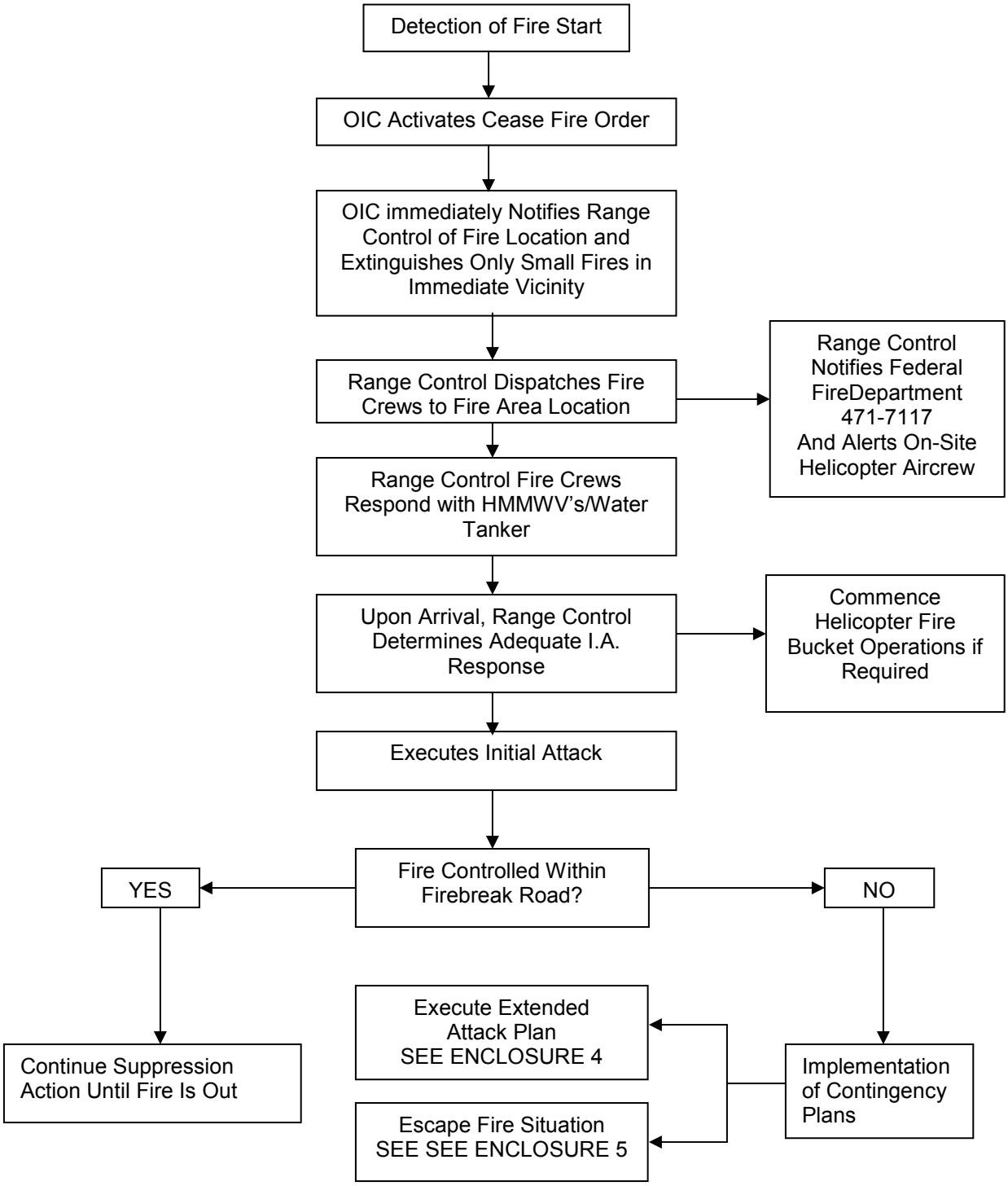
MAKUA MILITARY RESERVATION WILDFIRE SOP

ENCLOSURE 2 NOTIFICATION LIST

AGENCY NAME	PHONE NO.
FEDERAL FIRE DEPARTMENT (Emergency)	471-7117
Communications Center & Dispatch	474-2222
Honolulu Fire Department (Emergency)	911
25th ID(L) & USARHAW	
Installation Operations Center (IOC)	655-8763/8764
	655-2962 (Fax)
G3/DPTM, Range Division Hawaii	
Range Division Officer	655-1404
Range Operations Manager SB	655-5243/9509
Schofield Range Control	655-2292
ITAM	655-0582/8463
Installation Safety and Fire Protection	
Director	655-3350
Fire Chief	656-1331
Wildland Fire Program Manager	656-0615
	286-5818 (Cell)
DPW, Environmental	
Chief	656-2878, x-1062
Natural Resource Manager	656-2878, x-1050
Cultural Resource Manager	656-2878, x-1052
Oahu Biologist	656-7641/7741
U.S. AIR FORCE	
Kaena Point Satellite Tracking Station	697-4210
Makua Cable Head (DISAPAC)	696-2380
U.S. FISH & WILDLIFE SERVICE	
Field Supervisor	541-3441
Fax	541-3470
STATE OF HAWAII, DEPARTMENT OF LAND & NATURAL RESOURCES	
Division of Forestry and Wildlife	
Oahu District Forester	973-9787
State Protection Forester	587-4173
OHIKILOLO RANCH	
Mr. Albert Silva	696-6778/7910

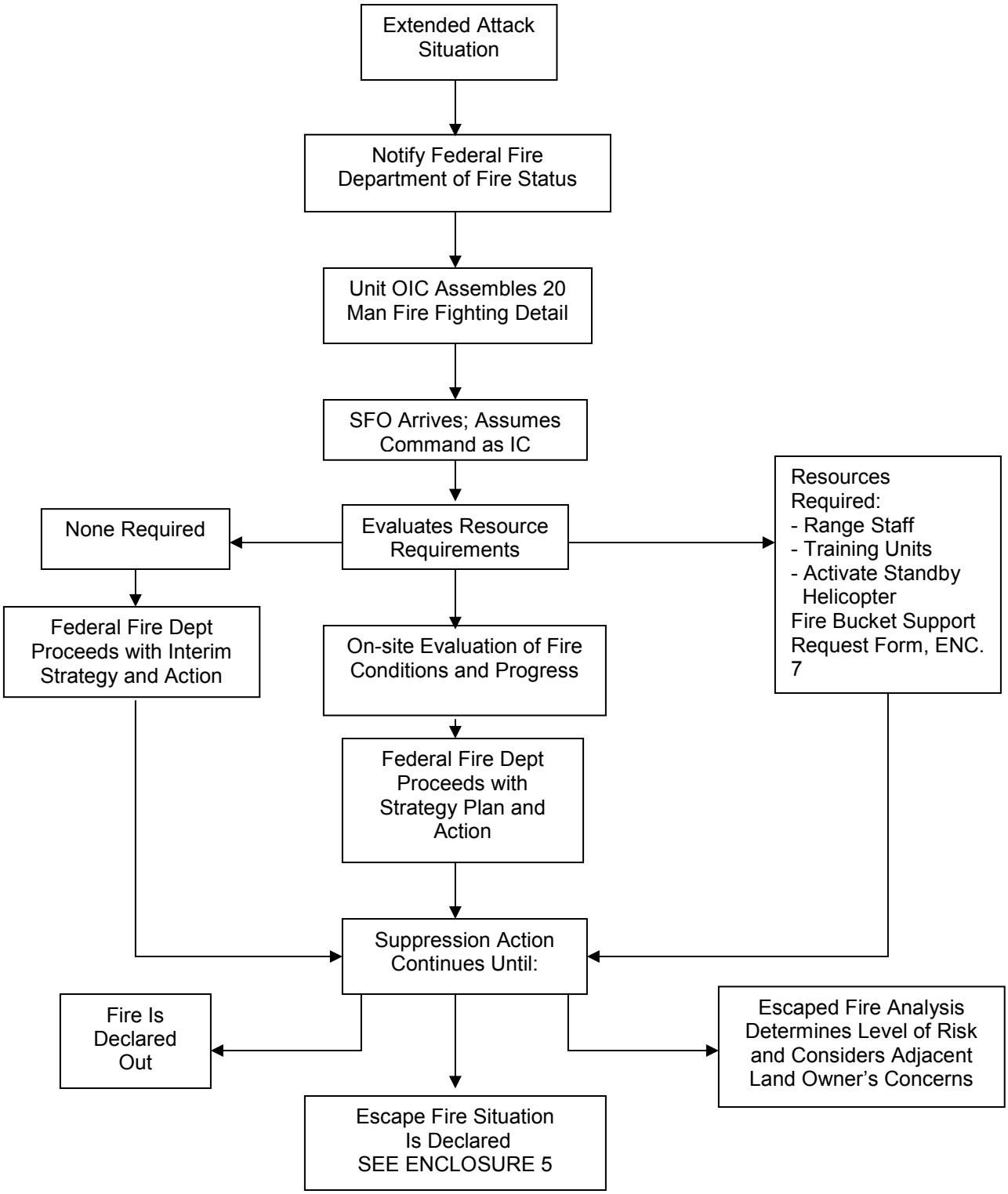
ENCLOSURE 3

MAKUA MILITARY RESERVATION (MMR)
OPERATIONAL DECISION CHART
INITIAL ATTACK PLAN



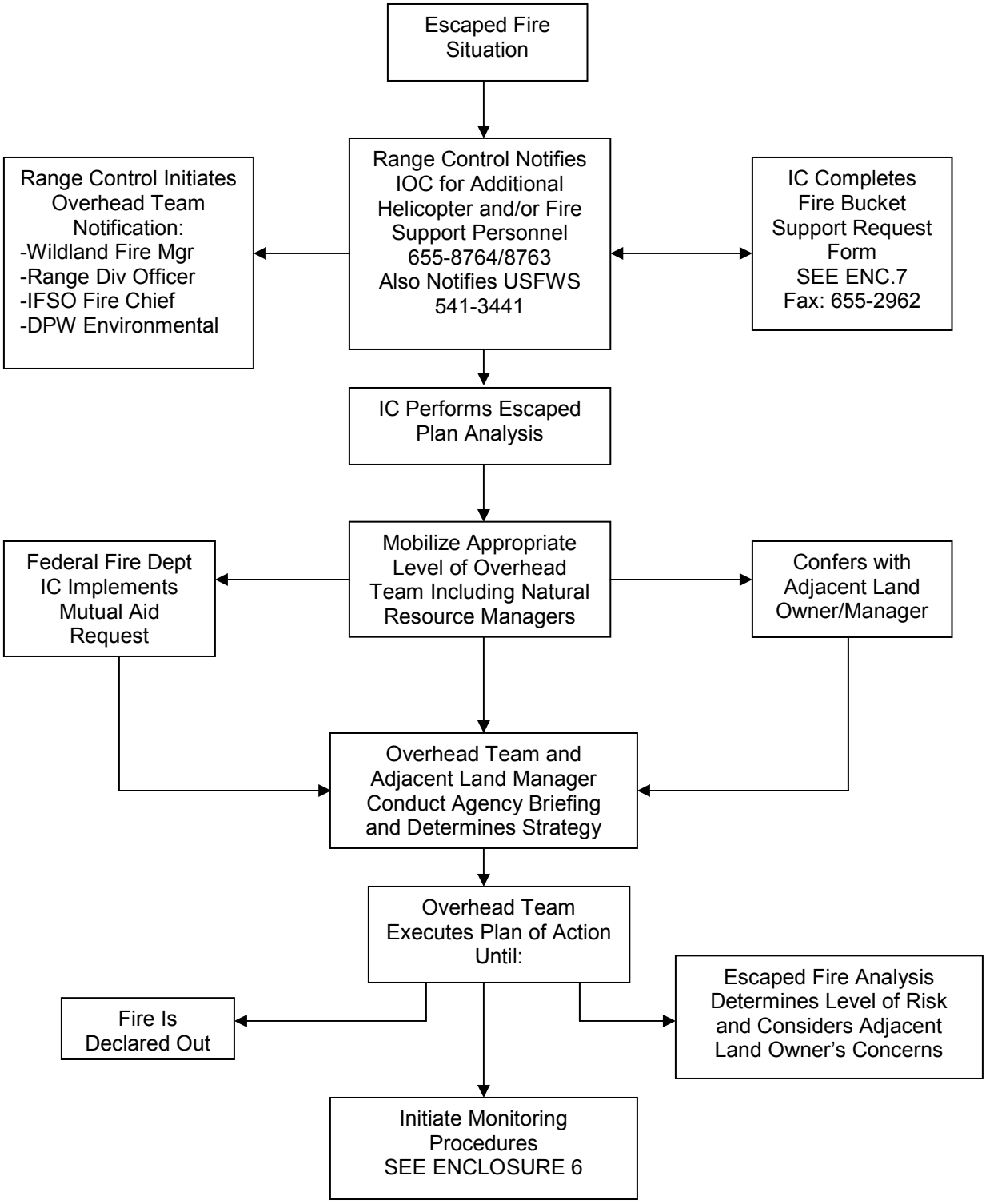
ENCLOSURE 4

MAKUA MILITARY RESERVATION (MMR) OPERATIONAL DECISION CHART A, EXTENDED ATTACK PLAN



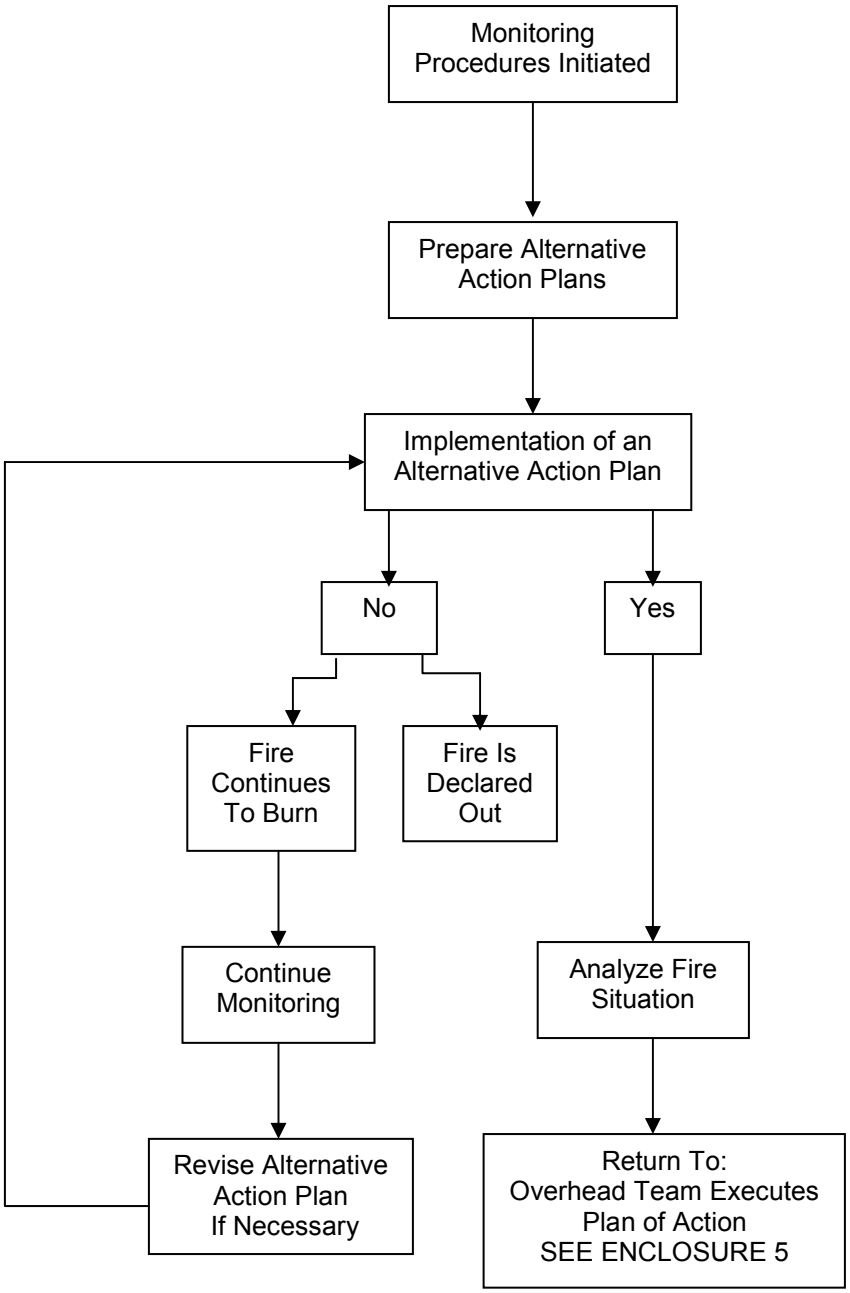
ENCLOSURE 5

MAKUA MILITARY RESERVATION (MMR)
OPERATIONAL DECISION CHART B
ESCAPE FIRE SITUATION (OUTSIDE FIREBREAK ROAD)



ENCLOSURE 6

MAKUA MILITARY RESERVATION (MMR)
OPERATIONAL DECISION CHART C
MONITORING PROCEDURES
(FIRES OUT OF CONTROL BEYOND MMR BOUNDARY)



ENCLOSURE 7

25th ID(L) & USARHAW Reg 350-1

Request for Rotary Wing Aircraft Support

Date of Request:

REQUEST FOR ROTARY-WINGED AVIATION SUPPORT Proponent of this Form is G3, 25 ID(L) May 97		1. Late Request? Yes / No If Yes, Letter Incl? Yes / No
2. Requesting Unit:	3. POC and Ph# or Freq and Call Sign:	4. Submitted or Coord at AMAC/G3 Conf ?____ If Yes, Date:
5. Date(s) Required: 5a. Unit's Cycle:	6. Number and Type of Aircraft Requested: 1x UH 60	7. MSC or SEP BN S3 AIR:
8. Pick-Up Point(s)/PZ(s):	9. Destination(s)/LZ(s):	
10. Contact at PZ:	11. Contact at LZ:	
12. Pick-Up Time:	13. Release Time:	
14. Passengers:		
15. Cargo: (type, number, weight)		
16. Special Instructions or Mission Equipment: (e.g. Headphones, Cargo Hook, C2 A/C etc.)		
17. Mission Description: (who, what, when, where, why)		
18. Initial Planning Coordination: (when and where)		
AVIATION USE ONLY		
19. Mission Received From: (name, unit, date, time)		20. Mission Number
21. Mission Passed To: (name, unit, date, time)		
22. Mission Passed To: (name, unit, date, time)		
23. Mission Passed To: (name, unit, date, time)		
24. Number of Aircraft Assigned to Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
25. Estimated Number of Hours for Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
26. Remarks:		

ENCLOSURE 8

FIRE DANGER RATING SYSTEM (FDRS) FOR MMR

FIRE DANGER RATING	BURN INDEX	CAUTION TO BE EXERCISED	NECESSARY PRECAUTIONS	HAZARD
GREEN	0-20.9	Use Normal Caution	Weather conditions favorable for all authorized munitions at MMR. Smoking is permitted.	LOW
YELLOW	21-47.9	Use Caution. Fires will start easily.	Yellow is the beginning of the danger period. Only ball ammunition, mortar, artillery, hand grenades (HE), and smoke grenades are allowed. Smoking is permitted only in designated areas.	MEDIUM
RED	48+	Use extreme caution. Fires are difficult to control.	No munitions or pyrotechnics are allowed. Smoking is not permitted on the ranges	HIGH

Burning Index Warning Table Makua Military Reservation

WINDSPEED	1 HOUR FUEL MOISTURE 4	5	6	7	8	9	10	11	12	13	14	15	17	19	21	23	25
0	27	26	24	23	22	21	20	19	17	16	15	12	7	6	4	2	0
1	33	31	29	28	27	25	24	22	21	19	18	15	9	7	5	3	0
2	40	38	36	34	32	30	29	27	25	23	21	18	11	9	6	3	0
3	46	44	41	39	37	35	33	32	30	27	25	21	13	10	7	4	0
4	52	50	47	45	42	40	38	36	34	31	28	24	14	11	8	4	0
5	58	55	52	50	47	45	42	40	37	34	31	27	16	13	9	5	0
6	64	60	57	54	52	49	46	44	41	38	34	29	17	14	10	5	0
7	69	65	62	59	56	53	50	47	44	41	37	32	19	15	11	6	0
8	74	70	67	63	60	57	54	51	47	44	40	34	20	16	11	6	0
9	79	75	71	67	64	61	57	54	51	47	42	36	21	17	12	6	0
10	84	79	75	71	68	64	61	57	54	50	45	38	23	18	13	6	0
11	88	84	79	75	71	68	64	60	56	52	47	41	24	19	14	6	0
12	93	88	83	79	75	71	67	63	59	55	50	43	25	20	15	6	0
14	101	96	91	86	82	77	73	69	65	60	54	46	27	22	16	6	0
16	109	103	98	93	88	84	79	75	70	65	58	50	30	24	17	6	0
18	117	111	105	99	94	89	85	80	75	69	62	54	32	25	17	6	0
20	124	118	111	106	100	95	90	85	79	73	66	57	34	27	17	6	0

Fuel Model N
10 Hr fuel Moisture = 1 Hr fuel moisture + 1
Live woody fuel moisture = 100 percent
Slope class = 1
State of weather = 0
Temperature = 80 deg F

ENCLOSURE 9 WILDLAND FIRE INCIDENT REPORT

WILDLAND FIRE INCIDENT REPORT

25TH ID(L) & USARHAW

1. INSTALLATION	2. INCIDENT NUMBER (YY-000)

3. DATE (YYMMDD)	4. FIRE LOCATION (Grid Coordinates 6 digits only)	5. RANGE OCCUPIED BY UNIT
	EJ	

6. TIME FIRE REPORTED	7. TIME FIRE OUT	8. TIME RANGE OPS RESPONDED	9. TIME FIRST SFO AT SCENE

10. AGENCY NOTIFICATION (*If applicable*)	PHONE	TIME CALLED	AT SCENE	REMARKS
❑ FEDERAL FIRE DEPARTMENT	471-7117			
❑ G3/RDH WILDLAND PROGRAM MGR	286-5818			
❑ INSTALLATION OPS CENTER (IOC)	655-8763			
❑ RANGE OFFICER	655-1404			
❑ RANGE OPERATIONS SUPERVISOR	655-9509			
❑ DPW NATURAL RESOURCE MGR	656-2878			
❑ U.S. FISH & WILDLIFE SERVICE	541-3441			
❑ (Other)				
❑ (Other)				

11. FIRE DANGER RATING	BURN INDEX (BI)	15. FIRE ESCAPE ANALYSIS	CHECK ONE	
			YES	NO
❑ GREEN ❑ YELLOW ❑ RED	13. EST. ACRES BURNED?	15a. FIRE STARTED OUTSIDE FIREBREAK ROAD?		
	14. > 10 ACRES? (AAR)	15b. FIRE ESCAPED FIREBREAK ROAD?		

16. HELICOPTER SUPPORT	16b. Aircraft Call Sign	Tail No.	16c. Arrived On Scene	Departed
☐ UH-60 ☐ CH-53 ☐ CH-46 ☐ CH-47 ☐ OTHER				
16a. BUCKET SIZE (*BAMBI*) ☐ 240-Gal ☐ 660-Gal ☐ 2000-Gal ☐ Other				

17. FIRE CAUSE (*Narrative*)	18. AMMUNITION TYPE	19. WEAPON SYSTEM
	❑ Tracer ❑ Mortar ❑ Artillery ❑ HE / WP ❑ Pyrotechnics ❑ Grenade ❑ Demo / Mines ❑ Other	❑ AT-4 ❑ TOW ❑ SAW / M-16 ❑ SMAW ❑ LAW ❑ Rocket / Missile ❑ M240/M60 ❑ Other

20. TRAINING UNIT	21. UNIT OIC	22. TELEPHONE	23. AAR REQUIRED?

24. REMARKS
(Narrative)

25. FIRE REPORT COMPLETED BY:	DATE	26. FIRE REPORT REVIEWED BY:	DATE

WILDLAND FIRE INCIDENT REPORT FORM
GENERAL INSTRUCTIONS

PURPOSE AND USE: Used in the administration of the Wildland Fire Management Program. The purpose of this form is to document all wildfire incident(s) on Army training lands under the jurisdiction of the 25th ID(L) and USARHAW within the state of Hawaii. This form will also be used to document when Army assets respond to any wildland fire incident outside of its jurisdiction in support of mutual aid requests. Documentation of all wildfires is necessary to ensure accurate fire history and trend analysis to assist fire managers in future fire management planning. The form becomes part of the permanent record file for each Fire Management Area (FMA). Fire records may be kept on an automated computer database as part of long term land management records. n

DISPOSITION OF FILES: The maintenance and disposition of all wildland fire incident reports shall be in accordance with Army record management policy. Disposition: a) OCE: Destroy after 25 years in CFA. b) Other Offices: Destroy after 5 years.

PROPONENCY: The proponent of this form is the Installation Fire & Safety Office (IFSO). Action Officer is the Wildland Fire Program Manager.

COMPLETION INSTRUCTIONS

Item 1 - Enter appropriate name of military installation where the fire occurred.

Item 2 - Fill in incident number. Enter 2 digit calendar year followed by 3 digits in numbered in sequence for the number of fires occurred during that calendar year.

Item 3 - Enter date of incident. Year, month, day (YYMMDD).

Item 4 - Fire location. Enter 6-digit grid coordinates that indicate where the fire started. Provide 6-digits only in blocks provided. *(Right, then Up)*

Item 5 - Enter range, firing point, or maneuver area the training unit causing the fire occupied at the time the fire started.

Item 6 - Enter the time of day the fire was first reported to Range control.

Item 7 - Enter the time of day the fire was reported extinguished.

Item 8 - Enter the time of day the first Range control fire crew/unit responded to the fire location.

Item 9 - Enter the time of day the first Range control fire crew/unit arrived at the fire scene.

Item 10 - Notification. Enter the time of day that Range Control first notified each agency or individual listed and enter the time each agency or individual arrived at the fire scene.

Federal Fire Dept:	Must be notified of all fires.
Wildland Fire Mgr:	Must be notified of all fires.
Installation Ops Ctr:	Notified if helicopter support or additional fire assets are required.
Range Officer:	Notified of all major fires only.
Range Ops Supv:	Must be notified of all fires.
Natural Res Mgr:	Notified if fires are potential threat to T&E plant or animal species.
USFWS:	Must be notified of all fires that escape firebreak road or installation boundary.
Remarks:	Enter appropriate comments if any.

Item 11 - Enter daily Fire Danger Rating.

Item 12 - Enter current Burn Index (BI) at the time of the fire start.

Item 13 - Enter total estimated number of acres destroyed by fire.

Item 14 - Enter YES if fire area is greater than 10 acres. The training unit OIC must submit an After-Action-Report (AAR) if fire area exceeds 10 acres. OIC must complete the AAR before clearing the range.

Item 15 - Fire Escape Analysis.
15a. Check Yes or No if fires started outside firebreak road.
15b. Check Yes or No if fires escaped the firebreak road.

Item 16 - Helicopter Support. Enter type of aircraft used on fire.
16a. Enter fire bucket size used on fire.
16b. Enter aircraft call sign tail number. (i.e., Hillclimber 150)
16c. Enter time of day aircraft arrived on scene and time aircraft departed.

Item 17 - Fill in narrative form any information as to the cause of the fire, ignition sources, or item known to have started the fire. DO NOT speculate. Validate with training unit OIC. Conduct fire investigation as required.

Item 18 - Indicate ammunition type used that caused the fire.

Item 19 - Indicate weapon system used that caused the fire.

Item 20 - Enter name of training unit that caused the fire.

Item 21 - Enter name of the OIC responsible for the training unit.

Item 22 - Enter the telephone number of the OIC of the training unit where he may be contacted in the event additional information is required.

Item 23 - Indicate if an AAR is required. If yes, AAR must be completed by the unit OIC and submitted to Range control prior to release or range clearance.

Item 24 - Remarks. Enter appropriate comments pertaining to subject wildfire incident, if any.

Item 25 - Enter date and name of individual filling out the fire report.

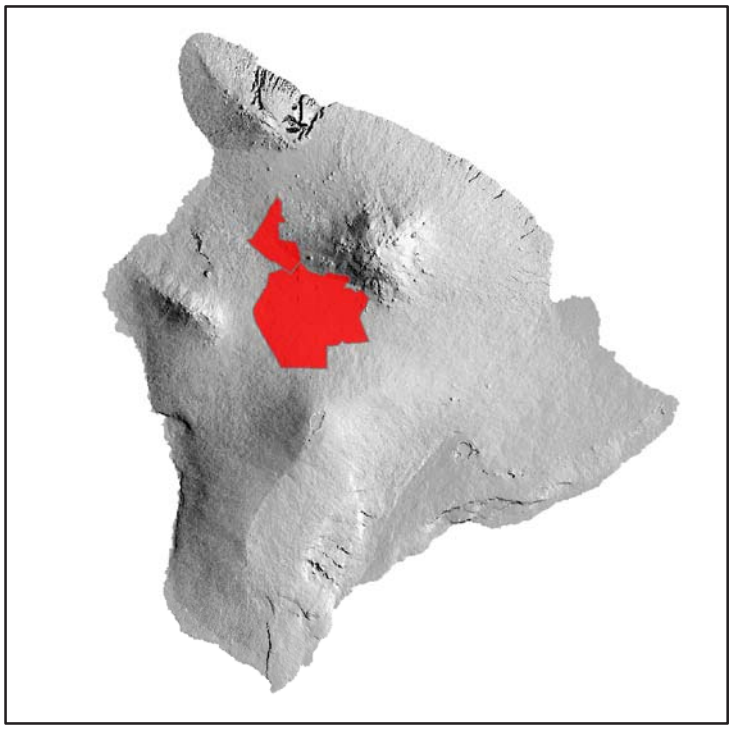
Item 26 - Enter date and name of the range supervisor reviewing the fire report. Range supervisor will review all fire incident reports for adequacy prior to submission to the wildland fire program manager.

FAX INSTRUCTIONS

A COPY OF ALL FIRE REPORTS WILL BE FAXED TO THE WILDLAND FIRE PROGRAM MANAGER WITHIN 24 HOURS AFTER THE FIRE INCIDENT IS REPORTED. ALL ORIGINAL WILDLAND FIRE INCIDENT REPORTS WILL BE MAINTAINED IN THE CURRENT FILE AREA OF EACH RESPECTIVE RANGE CONTROL OFFICE. A MAP MUST BE ATTACHED TO THE FIRE REPORT THAT IDENTIFIES AREAS BURNED.

POHAKULOA TRAINING AREA

STANDING OPERATING PROCEDURES



POHAKULOA TRAINING AREA WILDFIRE SOP

1. GENERAL

1.1. Purpose.

a. The purpose of this Standing Operating Procedure (SOP) is to provide specific requirements to delineate the responsibilities of Army Federal Fire Department (PTA FD), Range Control personnel and using military training units in the prevention and suppression of wildland fires at Pohakuloa Training Area (PTA). Its primary objective is to prevent unplanned ignitions through sound preventive measures. It also establishes procedures for fire control and the protection of natural/cultural resources from wildfires.

b. This SOP is a fire suppression guidance document for a wildfire response at PTA. It is intended to be used separately as a guidance manual by a responding wildland fire specialist, fire management officer, and/or Incident Commander (IC) unfamiliar with PTA. See Figure PTA-1 for an overview.

1.2. Scope and Applicability.

a. The provisions outlined in this SOP are applicable to personnel assigned to PTA, and all military training units utilizing PTA. The PTA Commander and senior unit commanders, regardless of service or component, whose unit has been allocated the use of PTA, will ensure compliance with this SOP.

b. All officers and noncommissioned officers will familiarize themselves with the contents of this SOP or receive a fire prevention briefing prior to use of the PTA range facilities. It is imperative that awareness on the part of all commanders is maintained and that all persons are instructed in fire prevention and fire suppression.

c. It is the intent of this SOP that all persons are made so aware, and that the instructions and guidance contained herein are employed with a view towards accomplishing training with an absolute minimum of unwanted fires.

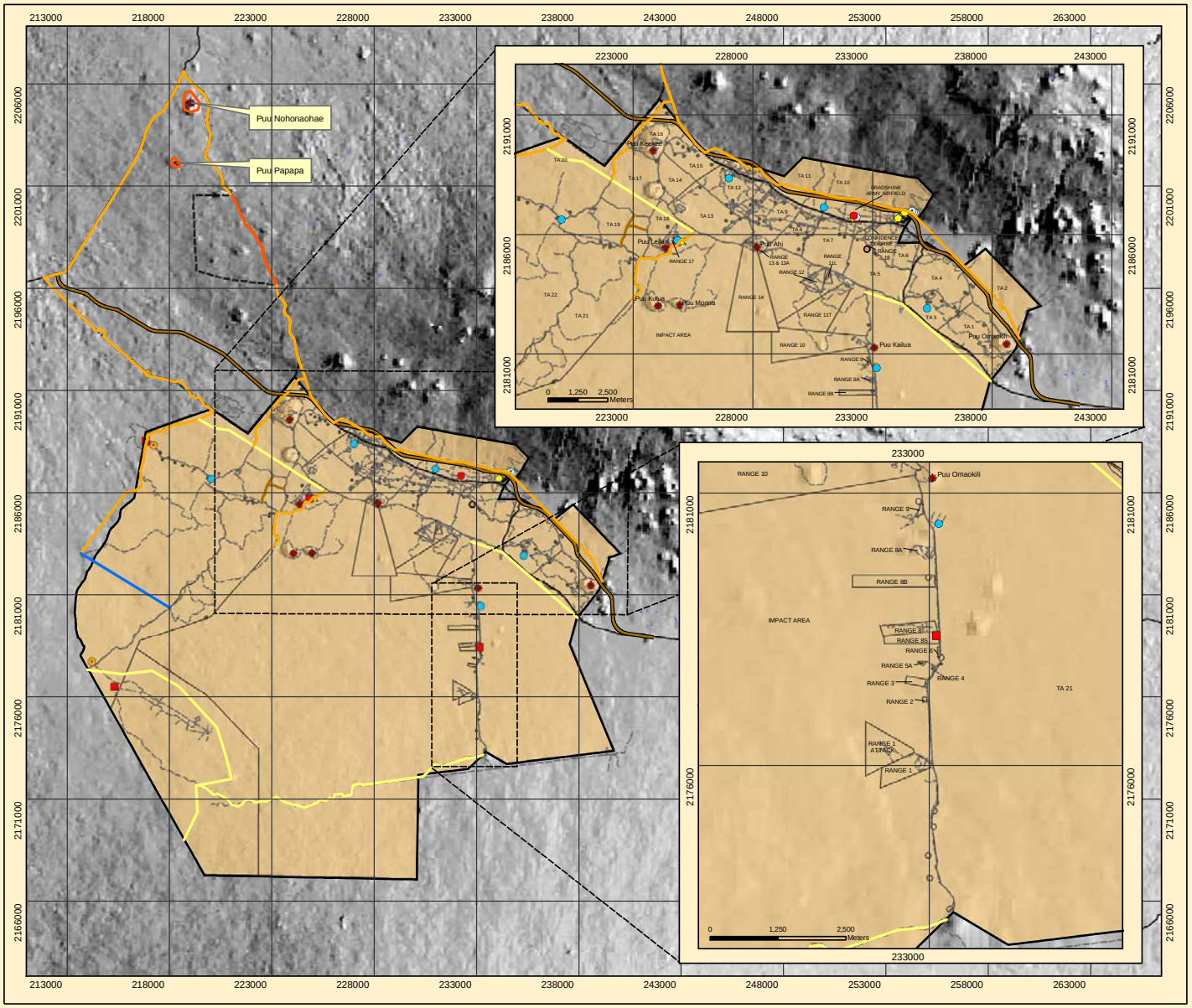
1.3. Responsibilities.

a. Commander PTA. The PTA Commander has the overall responsibility for fire prevention and protection requirements and environmental management at PTA.

b. Director of Installation Fire and Safety Office. The Director of Installation Fire and Safety has overall responsibility for the wildland fire management program.

c. Fire Chief, Army Fire Department (PTA FD). The PTA Deputy Fire Chief is responsible to the Director, Installation Fire & Safety Office, (Installation Fire Marshal) for the organization, supervision, and management of all aspects of the fire prevention and protection program in accordance with the provisions of Department of Defense Instruction (DoDI) 6055.6, Fire Protection.

(This Page Intentionally Left Blank)



Pohakuloa Training Area
Fire Suppression Resource Locations

Figure PTA - 1

Legend

Firebreaks
- Firebreak
- Fuelbreak/Firebreak
- Understory Fuelbreak
- Fuel Management Corridor
- Fire Access Road/Fuel Management

- Installation Boundary
- Keamuku Parcel
- Training Areas and Ranges

- Puus
- Dip Tank
- Fire Cache
- Fire Hydrant
- Fire Pump
- Hummer
- New FAARP Helipad
- Old FAARP Helipad
- Proposed Dip Tank
- Remote Auto Weather Station
- Water Tank

- Surface Water Body

Roads
- Primary
- Secondary
- Tertiary
- Unimproved
- Proposed Saddle Road Realignment

N

1:200,000

0 2,500 5,000 Meters

0 2.5 5 Miles

Data Source: USARHA IFSO

d. Range Officer, G3/DPTM, Range Division Hawaii. The Range Officer has overall responsibility for enforcing the provisions of the Integrated Wildland Fire Management Plan (IWFMP) and other applicable training directives and regulations, including restrictions on or cessation of training activities based on the day's fire danger rating. His representative is the PTA Range Operations Supervisor.

e. Range Operations Supervisor, PTA. The Range Operations Supervisor is responsible to the PTA Commander for ensuring proper fire prevention measures are taken by troops in the rear areas; fires in forested and other the training areas, when discovered, are promptly reported; and the PTA FD is augmented in fighting all fires on PTA.

f. Wildland Fire Program Manager, IFSO. The Wildland Fire Program Manager is responsible for the execution of the Army's Wildfire Management Program. Collaborates with other resource managers, PTA FD, and other cooperative fire agencies to ensure that supplies, equipment, training, and qualified personnel are available to meet the goals and objectives of the IWFMP.

g. PTA Wildland Fire Program Coordinator. Responsible for maintenance of firefighting infrastructure such as firebreaks and fuelbreaks, maintaining the fire cache, and other duties to be determined by the Wildland Fire Program Manager.

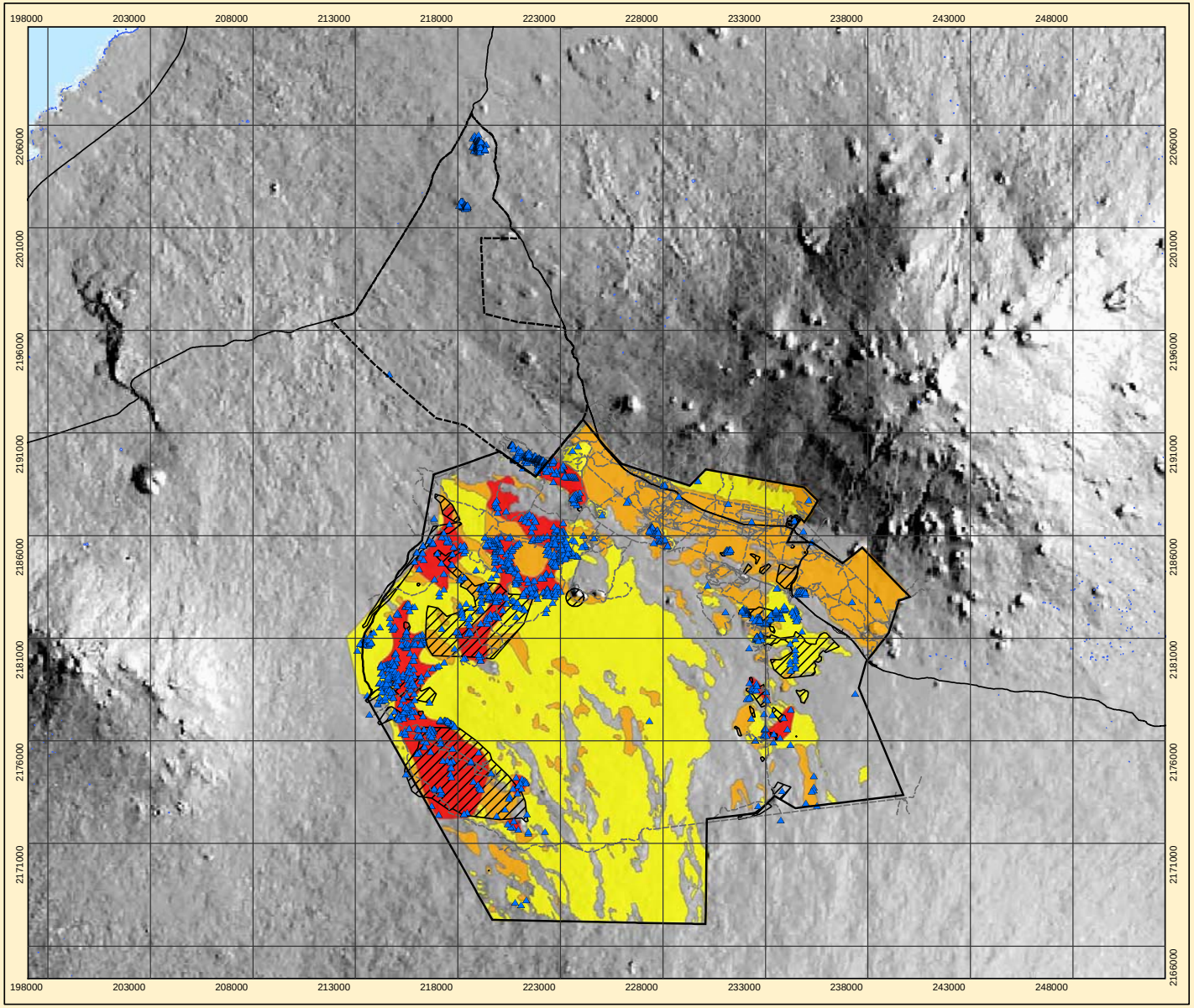
h. Unit Commanders and Division Chiefs. Commanders, managers, and supervisors at all levels of the organization are responsible for ensuring unit personnel are familiar with and comply with the provisions of this SOP and applicable regulations, fire prevention restrictions, training activities within biologically sensitive areas, providing qualified personnel to support the Wildfire Management Program.

1.4. Environmental Considerations.

a. Wildfires pose significant risks to threatened and endangered species of plants and animals and their native habitat. These native habitats are located throughout training area and adjacent to the installation boundary (see Figure PTA-2). Cultural resources including known archaeological sites are also found within the installation. Significant threats to the archaeological sites at PTA have generally been identified as explosive ordnance detonation, maneuvering activities, unmonitored ground disturbing activities and vegetation clearance. Fire is also a potential threat to archaeological sites from fire suppression activities.

b. Environmental Stewardship. Applicable environmental laws mandate the protection and conservation of natural/cultural resources. The use of various ammunitions, weapon systems, and pyrotechnics during live-fire training exercises increases the risk of wildfire and human or vehicular activity that can destroy native habitat. Live-fire training activities have the potential to burn large areas of native vegetation and threatened endangered species of plants and animals. The continued use of Army training lands in Hawaii depends upon the Army's ability to reduce the number of fire starts and control fires within the installation boundary.

(This Page Intentionally Left Blank)



Pohakuloa Training Area
Protected Resources

Figure PTA - 2

Legend

Biological Sensitive Areas

- BSA-1
- BSA-2
- BSA-3

- Sensitive Archeological Areas
- Federally Listed Species
- Installation Boundary
- Keamuku
- Surface Water Body

Roads

- Primary
- Secondary
- Tertiary
- Unimproved

N

1:200,000

0 2,500 5,000 Meters

0 2.5 5 Miles

Data Source: Programmatic Biological Assessment for Transformation of the 2nd Brigade 25th Infantry Division (Light) U.S. Army, Island of Hawaii. April 2003.
USAG HI DPW 2003

2. FIRE PREVENTION.

a. One of the primary objectives of this SOP is to integrate fire management actions with military training requirements and range operations. The prevention of fires is the responsibility of every individual training and/or working at PTA.

b. Fire prevention and the ability to control the spread of fires is critical for the continued survival of endangered plants, animals and native ecosystems, and the Army's continued use of the area as a live-fire range. Currently, there are many instances where military operations conflict with the management of these special natural resources. These conflicts often result in reduced training capability as "WILDLAND FIRES STOP TRAINING". Fire management actions are designed to reduce existing conflicts between necessary military training activities and the conservation of natural and cultural resources found within PTA.

2.1. Education.

a. Soldiers will be briefed prior to training about fire prevention, and cultural and natural resource protection. The fire prevention briefing ensures that important information is provided to using individuals that may start wildfires.

b. Signs will be posted throughout various areas as reminders of prevention and awareness of the Fire Danger Rating System (FDRS).

c. The Integrated Training Area Management (ITAM) and Directorate of Public Works (DPW), Environmental Conservation Office will provide training units with informational brochures to increase public and soldier awareness of the threat that wildfires pose to natural resource values.

2.2. Enforcement.

a. Enforcement of fire prevention and training policies is key to the success of an effective wildfire management program. Regulation amendments pertinent to fire may eventually become necessary to meet concerns generated by future increase in public and military use activities and/or changes in existing conditions.

b. Existing military training regulations and SOPs cover training activities and restrictions based on potential fire danger. Range Control safety staff has primary responsibility for ensuring that all regulations and SOPs are adhered to. Range Control and fire department personnel have the authority to stop live-fire training for noncompliance with any training regulation and/or this SOP.

c. Secondary responsibility rests with the using unit commanders.

d. Failure to comply with regulations governing fire safety and prevention policies may result in termination of training activities, de-certification, and administrative disciplinary action in accordance with applicable regulations.

2.3. Engineering.

a. Numerous construction and improvement projects are scheduled for PTA in regard to fire fighting infrastructure. Some of the larger projects are listed below:

(1) A new firebreak/fuelbreak is being built along the western boundary.

(2) A new firebreak/fuelbreak is planned for the northern boundary.

(3) Several fire management corridors are planned throughout PTA.

(4) Should the Keamuku parcel be purchased, several firebreaks and fuelbreaks will be established there.

(5) For a full overview of PTA fire fighting infrastructure, see Figure 14 of the IWFMP.

b. Firebreaks will be constructed to USARHAW standard width (see Section 4.3 of the IWFMP). The design and construction of the firebreaks will minimize negative effects to the extent feasible.

c. Engineering projects on training ranges shall be reviewed by the Wildland Fire Program Manager to ensure that fire prevention measures are considered during design, construction, or alignment of new ranges. Coordination with the G3/DPTM, Range Planner on engineering activities is essential to eliminate potential conflicts as related to fire prevention and fire safety.

d. An annual work plan identifying fire management projects by priority will be developed. This process will ensure that these projects (i.e., prescribed fire, maintenance of firebreak roads, herbicide, etc.) can be completed and will eliminate any conflicts between required maintenance of the ranges and military training activities.

2.4. Ignition Control.

a. The intent of rules governing the use of weapons systems and pyrotechnics is to protect endangered plants and their habitats as well as training lands throughout PTA.

b. While training at PTA, units must use extra caution during live-fire training exercises. Soldiers must be aware of and adhere to fire danger-rating restrictions of incendiary ammunition and/or pyrotechnics under identified fire weather parameters.

c. The FDRS for PTA is described in 3.1 and Enclosure 8 of this SOP. A supplemental system using wind speed criteria that is currently in place for the restrictions and/or use of pyrotechnics at PTA will continue to be in effect. (Refer to PTA External SOP, PTA Wind Standards for Pyrotechnic Use, page B-2-1)

3. PRE-SUPPRESSION ACTIONS.

3.1. Fire Danger Rating System (FDRS).

a. A FDRS designed specifically for PTA has been developed by the U.S. Forest Service and Colorado State University (CSU) based on analysis of PTA's fire history, fuels, fire behavior models, and weather/climatology. National fire danger rating indices as recommended by the U.S. Forest Service and CSU are applied to the predominant fire carrying vegetation in each of six fire danger rating areas (see Figure PTA-3). A supplemental system using wind speed criteria is currently in place for the restriction and/or use of pyrotechnics at PTA. Wind speed criteria and rules describing specific restrictions in various training areas are outlined in the matrix provided in Enclosure 8 of this SOP. See the PTA External SOP, Appendix 2 to Annex B, page B-2-1 through B-2-4 for a full description of the wind criteria.

b. The wind criteria will continue to be applied as they are currently.

(1) Wind speed data will be monitored daily and immediately prior to "HOT" range status.

(2) Range Control approval and guidance must be obtained prior to firing all pyrotechnics.

(3) Range Control will notify the training unit of any training restrictions being imposed as a result of unfavorable wind conditions.

c. Range control will be responsible for retrieving weather data from the RAWS throughout PTA and archiving it into the "WeatherPro" software program. The BI for each danger rating area, as determined by the National Fire Danger Rating System (NFDRS), will be used to rank fire danger based on known ignition sources.

d. The BI's will be monitored every hour, on the hour, and prior to projected "hot" range status. Range control will notify training units every hour, on the hour, of any training restrictions being imposed as a result of unfavorable fire danger ratings. Additionally, at any time that the BI changes from one category to another, the training unit will be notified.

e. Unit OIC's in charge of firing or training will allow firing or training to commence only after ascertaining the fire danger rating and wind speed and adopting the appropriate fire prevention measures.

f. While training at PTA, units must use caution during training exercises. Soldiers must be aware of and adhere to fire danger-rating restrictions of incendiary ammunition, pyrotechnics, smoking, and other ignition sources (see Enclosure 8). Strict compliance with training restrictions set forth herein will reduce the number of fire starts.

g. The FDRS for PTA is more complex than other FMA's because of the amount of land that it covers. The FDRS for PTA follows:

Station	Training Area	Fuel Model	Fire Danger Class (Burning Index)				
			Low	***Moderate***	***High***	***Very High***	***Extreme***
PTA East	1-6, 21	F	1-24	25-32	33-41	52-58	59+
PTA Portable	7-17	L	1-21	22-30	31-37	38-54	55+
PTA Kipuka Alala	23	F	1-19	20-29	30-36	37-50	51+
PTA West	18-20, 22	N	1-34	35-54	55-66	67-84	85+
PTA Kipuka Alala	Impact Area	C	1-17	18-26	27-36	37-48	49+
PTA West	Keamuku	N	1-34	35-54	55-66	67-84	85+

3.2. Minimum Staffing Requirements.

a. Proper staffing of the PTA FD shall be in accordance with DOD Instruction 6055.6, Fire Protection Program. At a minimum, six trained fire fighting personnel are required during expected high fire danger rating days and any scheduled live-fire training operation at PTA.

b. Range Control will be required to provide a minimum of two of the six required wildland trained firefighters. As first responders, they will continue to support the PTA FD until the fire is extinguished or until released by the SFO.

c. The PTA Deputy Fire Chief and Range Operations Supervisor will arrange work schedules to allow flexibility while ensuring that minimum staffing levels are met, including overtime authorizations. In the event of fire, fire fighting duties take precedence over other work assignments.

d. When deployed to PTA, military training units will also provide, upon request, a platoon unit (minimum of 20) to assist the PTA FD in fighting wildfires. One of the individuals will be a NCO to provide supervision of the detail. Units will designate this platoon upon arrival at PTA and establish a reliable method of notification between unit HQ, PTA FD, and Range Control. As the situation dictates, deployed unit commanders will be prepared to provide additional personnel as requested.

e. An fire bucket certified aviation crew will be on site at PTA any time that live-fire training is scheduled. See 3.7 for more details.

3.3. Training

a. Policy requires that all Range Control and PTA FD personnel engaged in wildfire suppression and prescribed fire duties meet the standards outlined in 4.6 of the IWFMP. The PTA Wildland Fire Program Coordinator will coordinate with the Range Control staff to develop a certification-training program or "Red Card" system.

b. Individuals will not be assigned to duties for which they lack training and/or certified experience. All Range Control and PTA FD personnel dispatched or assigned to wildfires or prescribed fires will be qualified for the fire position assigned, unless assigned as trainees and under direct supervision of higher qualified personnel at all times.

c. The PTA FD training officer will administer and manage an effective qualification and certification program for fire department personnel. He will monitor all employees' wildland fire management development (training and experience) to ensure accurate qualification and certification standards.

d. The PTA Wildland Fire Program Coordinator will coordinate with the PTA FD training officer to develop the annual wildland training schedule. A recurring proficiency program will include quality instruction and evaluation of employee's proficiency level through quarterly training exercises that are monitored by the fire department training officer.

e. Military units assigned to the perform emergency fire fighting detail activities will be briefed properly by qualified fire fighting personnel prior to engaging in any wildland fire suppression activity.

3.4. Fire Equipment and Supplies.

a. If at any time the required fire suppression equipment is not operational, live-fire training will be suspended until all equipment is operational. Live-fire training will only be conducted when the required number of fully trained/certified personnel and functioning equipment are available for fire suppression. This requirement pertains to all types of fire fighting equipment, water resources, and personnel. Emergency contingency plans must be developed by the PTA FD to ensure that this requirement is met.

b. The PTA FD will maintain a cache of fire equipment in a constant state of readiness. The fire cache will contain a supply of PPE, fire hand tools, chainsaws, pumps, forestry hose, foam concentrate, etc., with the required numbers as identified for PTA in Section 4.2.3 of the IWFMP.

c. The PTA Wildland Fire Program Coordinator will hand receipt all wildland fire equipment required in the fire cache.

d. The PTA Deputy Fire Chief will conduct periodic checks to ensure all resources are in place and will immediately notify the Wildland Fire Program Manager of any deficiencies and/or equipment replacement.

3.5. Personal Protective Equipment (PPE).

a. It is mandatory that all fire fighting personnel assigned to PTA be equipped with proper PPE necessary for combating wildfires (see Reference 4.2.2 of the IWFMP). Range Control personnel will ensure that proper PPE is worn at all times when actively engaged in fire fighting duties. Personal safety and prevention of injuries is the first priority in every fire management activity.

b. PPE for training units will be issued from the fire cache supplies. The fire cache will be maintained by the PTA FD and shall be equipped to outfit a minimum of one-hundred (100) firefighters with appropriate PPE.

3.6. Fire Response Vehicles.

a. Two HMMWV's or Brush Engines equipped with a 300-gallon slip-on pump unit (Class A foam capable) and one Water Tender (2000-gallon capacity) or equivalent shall be assigned and available for initial attack response at PTA. This can be a combination of RDH and PTA FD assets.

b. Range Control personnel operating fire response vehicles shall be qualified and licensed to operate emergency vehicles. The Wildland Fire Program Manager shall monitor vehicle qualification and training program for Range Control staff.

c. Personnel will perform daily preventive maintenance inspections of vehicles and pumps to ensure operational readiness. All discrepancies shall be identified and coordinated through appropriate channels for Priority 03 repair/replacement.

d. When wildland vehicle fire fighting capability is degraded, which will adversely affect the fire protection of the ranges, notification of the PTA Commander, Range Officer, Installation Fire Marshal, and Wildland Fire Program Manager is mandatory. The PTA Deputy Fire Chief is responsible to notify all appropriate offices. On advise of the PTA Deputy Fire Chief, the PTA Commander makes the decision to continue operations and accept the risk, or consider curtailing live-fire training activities until fire fighting capability is restored.

e. Organizational unit support for vehicle repairs and preventive maintenance are not available at PTA. Therefore, the Wildland Fire Program Manager will establish an annual service contract or agreement with local commercial vendor(s) to perform all emergency vehicle repairs and recurring preventive maintenance for both HMMWV's assigned to PTA Range Control.

f. There are numerous locations to refill HMMWV's or tankers throughout PTA.

(1) The PTA cantonment area has a fire hydrant water distribution system that can be used in support of wildfire suppression operations. However, water usage must be closely monitored during extended fire operations to ensure that water levels are not entirely depleted from the main storage tanks on post. During major fire operations, the DPW shall continuously monitor usage for replenishment and to ensure safe and acceptable water levels for base camp usage.

(2) There are six existing dip tanks located throughout PTA proper. See Figure PTA-1 for their locations.

(3) In addition, there is a non-potable 60,000 gallon water storage tank located at Bradshaw Army Airfield. It is equipped with a fire pump capable of providing rapid water re-supply services to fire vehicles or water tenders in support of water shuttle delivery to and from the fire area.

(4) Three GSA leased 5,000-gallon water tankers are assigned at PTA. These water tankers are parked at designated spots of the training area and are used to shuttle water to refill the dip tanks or provide a water source for ground fire fighting crews. In the event of a major wildfire, the IC must request assistance from DOL Transportation staff to provide drivers of the tractors that will mobilize these water tankers where required. Pending availability of the drivers (due to other potential logistical missions) delays in response can be expected. If the situation dictates, fires will take precedence over other assigned missions.

(5) Portable and collapsible water tanks (3,000-gallon capacity) and water blivetts, may also be deployed to support wildfire suppression activities on the ground. These units may be sling-loaded by helicopter to remote areas down range in support of ground fire fighting crews.

3.7. Helicopter Fire Bucket Support.

a. There are currently no permanently assigned aircraft at PTA. However, it is required that a military helicopter with a certified and trained aircrew capable of performing fire bucket operations be on site at PTA during live-fire training operations. A UH-60, CH-46/7, or CH-53 will be on site when Battalion or Brigade sized units deploy to PTA.

b. During the pre-training coordination, the unit must arrange for helicopter support dedicated for aerial fire bucket operations in accordance with this SOP. No live-fire activity will occur until a helicopter and certified aircrew is on station at PTA.

c. In addition, a backup helicopter under contract services to the Army will be available and able to arrive at PTA within 90 minutes after notification. The IFSO is the proponent for wildland fire and will be responsible for ensuring that commercial helicopter contract services are in place and funded. The Senior Fire Officer (SFO) or other authorized individuals identified in the contract have the authority to request helicopter services when required.

d. In the event of a major wildfire, contingency plans must be established and implemented when requesting additional military helicopters from Oahu or from available surrounding fire cooperators for fire bucket operations. (See Fire Bucket Request Form, Enclosure 7).

e. Helicopter aviation support units arriving at PTA will provide RDH with a list of all pilots and aircrew members that are certified and trained in fire bucket operations and fire suppression application techniques for wildland fires. The list will be updated as required and will be submitted to Range Control or the PTA FD upon arrival of the Pilot In Command (PIC) at PTA.

f. Military helicopter units (including contracted helicopters) must provide their own fire buckets. PTA currently maintains three BAMBI fire buckets: two (2) 660-gallon and one (1) 2000-gallon for emergency backup use by military UH-60, CH-53, or CH-47 aircraft assigned to conduct fire bucket operations.

g. PTA Range Maintenance is responsible for ensuring that a serviceable BAMBI bucket is available for use by trained helicopter aircrews at all times. All discrepancies and status of inoperable fire buckets must be immediately reported to Range Maintenance to coordinate immediate repair or replacement.

h. Upon arrival of the assigned helicopter at PTA, the PIC will coordinate with the PTA FD on the use of the dip tanks and will conduct joint fire bucket operational readiness exercises prior to any live-fire activities.

i. The RDH Range Operations Supervisor will ensure that the six dip tanks located at PTA are filled to at least 80% of their maximum capacities at all times. The Range Operations Supervisor will immediately coordinate with Directorate of Logistics (DOL) Transportation, for water hauling services to refill the dip tanks in the event the water level falls below the minimum water capacity required.

j. Air-to-ground radio communication must be established with the PTA FD and helicopter support units involved in fire suppression activities. The capability for the IC to coordinate and direct air support with ground fire fighting crews is essential for safe and effective application. Refer to the Army's Aviation Plan, Section 5.7 of the IWFMP and Communication Plan, Section 5.6 of the IWFMP, for assigned radio frequencies and water resource locations at PTA.

k. There is no natural surface water at PTA. Water storage for dipping is located throughout the installation.

(1) There are six dip tanks located throughout PTA proper. See Figure PTA-1 for their locations. Grid coordinates for their locations are provided in Section 5.7 of the IWFMP.

(2) Neighboring ranch landowners (e.g., Waikii Ranch, Parker Ranch) adjacent to PTA may be able to provide water resources during wildfire emergencies. However these unlined stock ponds and few lined reservoirs have a limited supply. Any use of these water sources for fire suppression would be a major imposition on the rancher during drought periods. Cooperative Agreements between the Army and with each landowner should be established to determine which reservoirs are authorized for use during major wildfires.

3.8. Other Resources.

a. Cooperative agreements with other local fire cooperators (Hawaii County Fire Department, National Park Service, State Civil Defense, National Guard, and Division of Forestry and Wildlife) for mutual aid support have been established to provide for multiple agency response and cooperative assistance between agencies. Existing agreements shall be updated and reviewed annually or as required.

b. The 25th ID(L) & USARHAW on Oahu will provide additional fire fighting resources upon request. The Installation Operations Center (IOC) shall be notified immediately in the event of a major wildfire that has the potential to threaten life, property, or damage critical habitat areas at or adjacent PTA. Due to the travel distance between Oahu and PTA, the decision by the IC to request additional USARHAW assets must be established at the earliest possible time to avoid any delays. A sense of urgency must be realized to affect timely response to mobilize military helicopters and/or manpower resources immediately to PTA upon receipt of the official request.

4. FIRE SUPPRESSION ACTIONS.

4.1. Fire Reporting and Notification Procedures.

a. Early fire detection and prompt reporting is critical in an effective initial attack. All fires, regardless of size, will be reported immediately to Range Control and in turn, to the PTA FD. Units will follow the fire reporting procedures below:

(1) In the event of a wildland fire on any range, impact area or maneuver area, the officer in charge (OIC) will immediately notify Range Control by the most expeditious means possible (radio or telephone), stating the exact location (grid coordinates) and the extent of the fire. The OIC will immediately initiate a “cease fire” order and remain in the area with the unit subject to the orders of the Range Control and/or PTA FD when they arrive on the scene. Refer to PTA Operational Decision Chart, Initial Attack Plan, Enclosure 3 to this SOP

(2) Fires started in the impact area will be monitored for potential escape or threat to high valued areas. Units will not be allowed to resume training until the fire is extinguished or until approved by the Range Operations Supervisor, PTA Deputy Fire Chief and/or SFO.

(3) Failure to report any fire will result in termination of scheduled training, de-certification, and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

(4) Upon notification of a fire, Range Control will immediately notify the PTA FD by telephone (x-417) or by radio communication and provide exact location (grid coordinates), building or range number, maneuver area, or make a reference to a prominent terrain feature (e.g. Puu Kapele, Puu Leilani).

4.2. Initial Attack.

a. Immediate and aggressive response to all fires is an unconditional recommendation for PTA. Within the confines of due care for personnel safety, the high resource values of the area justify the fullest commitment to expeditious containment and control of all fires. The difficult and often hazardous fire conditions warrant total initial effort to arrest fires in the early stages. Fiscal consideration must be secondary in ensuring timely and adequate availability of necessary fire fighting resources. The savings to be realized from a successful initial attack will offset the cost of many so called “over reactions.”

b. Upon notification of a fire by Range Control, the PTA FD will immediately proceed to the scene of the fire and assume command and control of all fire fighting activities. At this time, the fire will be evaluated as “Routine”, “Serious”, or “Critical”. Definitions:

(1) ROUTINE. Wildland fires that can be handled by the PTA FD or Range Control.

(2) SERIOUS. Wildland fires that may require the assistance of helicopters, bulldozers, and/or military personnel under direct supervision of the PTA FD.

(3) CRITICAL. Wildland fires that will require the assistance of mutual aid and pose a critical threat to loss of high value resources and/or potentially may leave the installation.

c. In the event fire escapes the initial attack, the IC will implement an extended attack plan or fire escape contingency plan. (Refer to Enclosure 4, Extended Attack Plan; Enclosure 5, Escape Fire Situation; and Enclosure 6, Monitoring Procedures, of this SOP).

d. Types of Attack.

(1) Direct Initial Attack (IA). Direct initial attack by the training unit or trained Range Control staff at the onset can suppress fires at the point of origin while still small and prevent fires from spreading. However, fuel loads, and terrain conditions at DMR currently limit safe and effective direct attack by fire crews in some of the area. Ground fire fighting crews can be effective for containing, or at least retarding the spread of fires until water/retardant drops from helicopters are on line. Direct attack with helicopter water drops can be very effective. Aerial fire bucket operations will be utilized to control fire in remote areas that are inaccessible by ground fire fighting teams.

(2) Indirect Attack. Indirect attack is the use of ground crews or aircraft to create control lines in front of fires before the fire arrives. In areas with heavier fuel loads or when the fire is exhibiting intense behavior, indirect attack incorporating offset hand lines roads and pre-constructed firebreaks can be used as an approach.

e. Recommendation for suppression outside the impact area. The direct attack method is considered the best method outside the impact area. Hand crews, brush engines and aerial buckets can be used in this area. Since it is desired to suppress a fire as quickly as possible using crews with hand tools and engines/buckets with water/foam directly on a fireline is recommended. Black lines/backfiring can also be established as a control measure for fuel starvation, but should only be utilized as a last resort. Due to the rough terrain in portions of the installation and the presence of cultural sites, bulldozer lines are also considered a last resort and should be only sited (unless used to clear old paths) with the recommendation of the DPW Environmental Division. Most areas of PTA contain existing roads or old bulldozer lines that can be cleaned up and used as control lines. The firebreaks and these pre-existing roads provide many control lines to black line/backfire off of if necessary. The HUMMER Brush Engine can maneuver on all of these roads. Water Tenders and other Type 50/60 Brush Engines should be careful about what roads they drive on. Many are very rocky and flat tires or getting a vehicle stuck are real possibilities. Structural engines/tenders should only be allowed on paved or graveled roads. Escape/Safety zones can be designated in the many barren areas that exist throughout PTA. However, there are extensive expanses of unbroken vegetation at PTA. Care should be taken to plan at least two escape routes and safety zones.

f. Recommendation for suppression inside the impact area. Both the direct attack and indirect attack method can be used inside the impact area, though all attack will have to be from the air. UXO concerns prevent entry of any personnel into the impact area to fight fires. Use of aerial buckets with water/foam directly on a fireline or indirectly to establish foam or retardant lines in front of, or around a fire, is recommended. During an extended attack, DPW Environmental Division personnel can assist with establishing protection priorities.

4.3. Command and Control.

a. The PTA FD will establish command and organize fire ground operations under the Incident Command System (ICS) and Unified Command during multi-agency response.

b. The PTA Deputy Fire Chief or the SFO will serve as the Incident Commander (IC) for all wildfires on PTA. The IC will establish a command post when it is anticipated that the fire incident is actually of a serious or critical nature. In the event of a major wildfire incident, an overhead team may be mobilized to assist the IC in command and control during extended operations.

c. Once resources have been committed to fire fighting, they are under the control of the IC. The IC directs the overall employment of auxiliary fire fighting resources to contain and extinguish the fire. This does not preclude unit commanders from rotating personnel and equipment necessary for rehab. Particular attention must be given to the increased physical demands placed on personnel by the high altitude.

d. The IC will notify the PTA Commander and/or Task Force Headquarters, requesting military assistance for combating fires or other logistical support (hot meals, vehicles, etc.) as a result of major fires. The primary mission of the unit commanders in the geographical area will shift from training objectives to fire control.

e. The use of military personnel will only be authorized under the most extreme circumstances. When utilized, military personnel will be under the control of a qualified fire department officer.

f. The IC will initiate action requesting mutual aid support from other fire agencies in accordance with established Cooperative Agreements when required.

g. Fires started from outside the PTA boundary that have potential to carry into high value resource areas on PTA justify the fullest commitment to aggressive containment and control. The Army shall work with adjacent landowners to control fires before they escape or reach PTA.

5. POST-FIRE ACTIONS.

5.1. Records and Fire Reports.

a. It is important that all fire incidents (to include fires in the impact areas) are documented to ensure an accurate fire history is maintained. Fire reports are used to track location, size, cause, frequency, and for fire trend analysis for future input and use in fire threat analyses.

b. The PTA FD will maintain a log of all fires. All fire incidents will be assigned a fire number and will be officially recorded on the standard Wildland Fire Incident Report (WFIR) form for Army training lands. A sample Wildland Fire Incident Report form is included in Enclosure 9 of this SOP.

c. The PTA Deputy Fire Chief will review all fire reports for accuracy and proper completion of the WFIR. A copy of each report will be faxed to the Wildland Fire Program Manager on Oahu at the earliest opportunity but NLT 72 hours after the fire incident.

d. Once compiled a quarterly fire report summary will be developed by the Wildland Fire Program Manager and submitted for review by the PTA Commander, Range Operations Supervisor, Range Officer, PTA Environmental Office, and Installation Fire Marshal.

e. Fire records will be kept on an automated computer database and maintained by the Wildland Fire Program Manager for accurate fire history and fire trend analysis. The Wildland Fire Program Manager and DPW Natural Resource Manager will coordinate submission of semi-annual fire incident reports to USFWS NLT 10 July and 10 January of each calendar year.

5.2. Surveys

a. In addition to the reports and reviews that are completed immediately after a wildfire, a post-fire analysis survey of the burned area may be required depending on the fire's location and vegetation damaged. The post-fire analysis may be combined with any of the informal or formal investigations. A post-fire analysis will need to determine either all or part of the following:

(1) The effect the fire may have had on native or alien flora and fauna resources and cultural resources.

(2) The effectiveness of the pre-suppression measures including fuel modifications.

(3) The effectiveness of the suppression resources and measures used.

(4) The effectiveness of the ICS.

(5) The effectiveness of fire/fuel models used.

(6) A safety review of suppression actions.

b. A post-fire survey of the fire area will be conducted with the coordination of the DPW Environmental and ITAM office.

c. The effects of fire on threatened and endangered species or effects from catastrophic events must be surveyed at the earliest opportunity.

d. If during the survey, it becomes evident that a wildfire has occurred outside the installation boundary, and/or affected any BSA, SEA, or threatened any endangered species, the USFWS and the State of Hawaii, Division of Forestry & Wildlife (DOFAW) will be notified. If military training activities were determined to have caused the wildfire, the Army will reinitiate Section 7 consultation under the Endangered Species Act (ESA).

e. If a UXO survey or clearing operation is desired, coordination with the Explosive Ordnance Disposal (EOD) unit is necessary. Surveys or clearing operations must be planned, coordinated, and should be carried out immediately after a fire.

5.3. Investigations and Accident Reporting.

a. After Action Reports (AAR) will be conducted for fires of four hectares (ten acres) or more and/or during which unusual events occurred, including failure to follow instructions.

b. The RDH will request a formal investigation for fires involving any of the following:

(1) Training related caused fires escaping or starting outside the PTA boundary.

(2) Damage or loss of valuable property exceeding $1000.00.

(3) Damage of loss to Biological Sensitive Area (BSA) or incidental take of plant or animal specie.

(4) All entrapments of fire shelter deployments.

(5) Major injury or fire fatality.

ENCLOSURE 1 FIRE PREVENTION BRIEFING

The following verbiage will be included in a general safety, environmental and fire prevention briefing to be given to all personnel before training at PTA.

The purpose of this brief is to educate users of the range about the dangers of fire on the range. Fire prevention is the responsibility of every person working or training on the range. There are several reasons that fire prevention is so important. Fire poses a grave threat to endangered plants and animals at PTA. Fires also pose a danger of damage to archaeological sites. If a fire starts, training in the immediate area must cease, and training downtime will result. For these reasons, every effort must be made to prevent range fires. In order to prevent fires, you must follow the following rules:

1. Smoking on the ranges is prohibited with the exception of barren areas such as roads and lava flows. Smoking is prohibited in the Palila Critical Habitat, Kipuka Alala (except in the rock quarry), Kipuka Kalawamauna, and on the military vehicle trail.

2. Pyrotechnics or simulators of any kind are prohibited in the Palila Critical Habitat, Kipuka Alala, and Kipuka Kalawamauna.

3. Open fires are not authorized in the Palila Critical Habitat or on the military vehicle trail.

4. Heat tabs and similar commercial products must be used inside metal containers.

5. Where use of smoke grenades or simulators is authorized, they must be used in such a manner that fires will not ignite. This means do not place smoke grenades or simulators in vegetated areas. Place them in the dirt or in metal cans provided by Range Control. Units are required to use metal barrels provided by Range Control in which to place grenades.

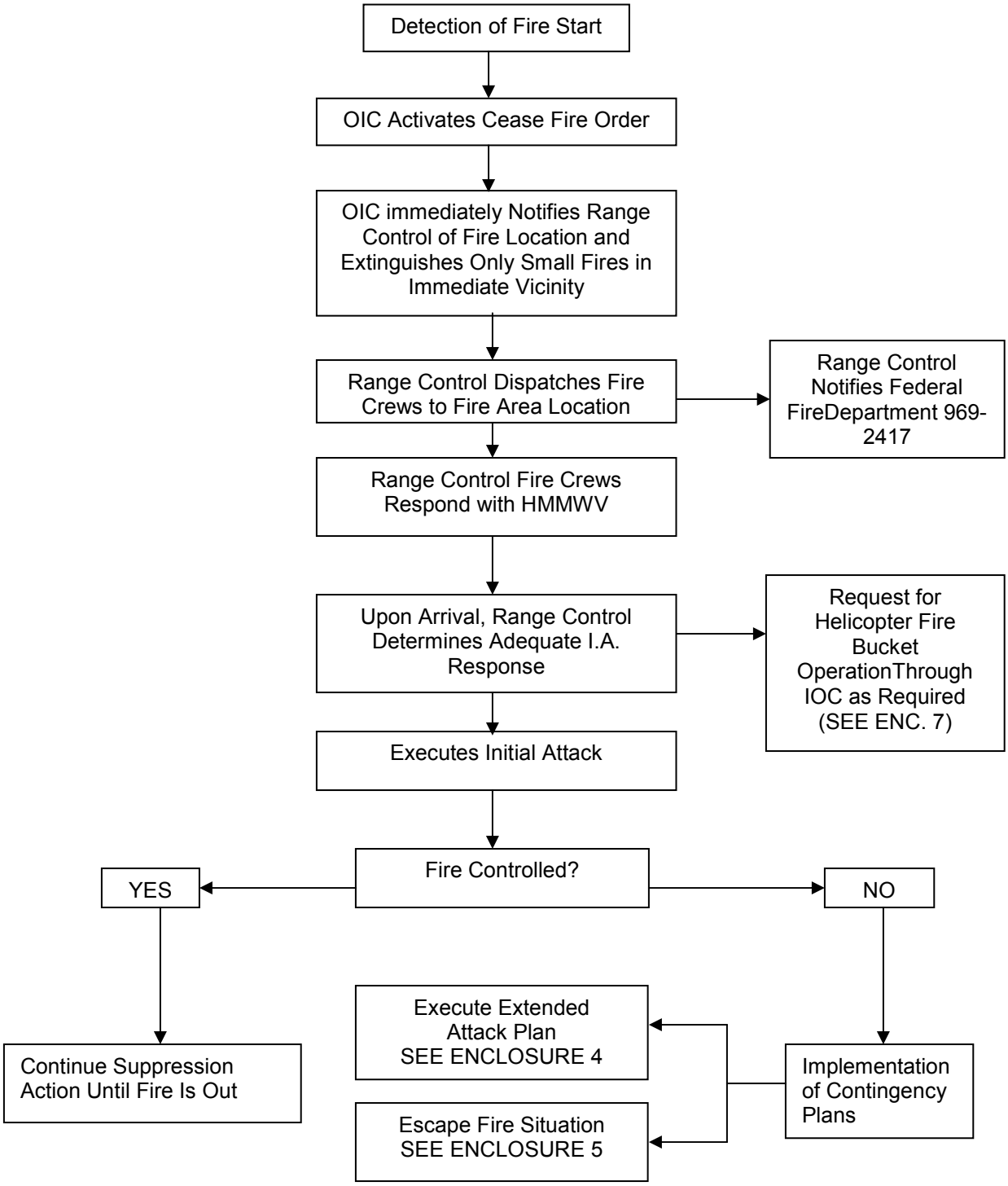
In the event a fire is started, cease training immediately. All fires, regardless of size must be reported immediately to PTA Range Control by radio or telephone. Every safe effort must be made to put the fire out, and to do so as quickly as possible. Every resource available on the Range must be committed to this effort. These resources include the helicopter with fire bucket, HUMMER Brush Engine fire trucks, and those of you that have been designated as part of the fire fighting team. Your unit leaders will advise you if you are on this team. In the event this fire fighting team is required, a trained safety technician will direct your work to put the fire out. The fire fighting team must be knowledgeable of safety and the proper use of backpacks and hand tools for fire fighting. When needed, this fire equipment will be issued at a designated site (Designate a site that everyone is familiar with). (demonstrate the use of water backpack and fire swatter) Water for fire fighting is available at the cantonment area, from fire fighting crews, and from dip tanks located throughout the training area.

ENCLOSURE 2 NOTIFICATION LIST

AGENCY NAME	PHONE NO.
PTA FIRE DEPARTMENT (EMERGENCY)	969-2417, x-417
Communications Center-Bldg T-390 (Bradshaw AAF)	969-2441/2442
Hawaii County Fire Department (Emergency)	911
25th ID(L) & USARHAW	
Installation Operations Center (IOC)	655-8763/8764
	655-2962 (Fax)
G3/DPTM, Range Division Hawaii	
PTA Range Operations Supervisor	969-2410/411
PTA Range Maintenance Supervisor	969-2414
PTA Range Control	969-2410/411
Range Division Officer (Oahu)	655-1404
Schofield Range Control	655-2292
Installation Fire & Safety Office	
Director (Fire Marshal)	655-3350
Fire Chief	656-1331
Wildland Fire Program Manager	656-0615
	286-5818 (Cell)
DPW, Environmental Office	
Natural Resource Manager	969-1966
Cultural Resource Manager	969-1966
Chief (Oahu)	656-2878, x-1062
HAWAII COUNTY FIRE DEPARTMENT	
Fire Dispatch	961-8336
HAWAII VOLCANOES NATIONAL PARK SERVICE	
Fire Management Officer	985-6042/6043
Fire Cache	985-6044/6045
NPS Headquarters	985-8640
STATE OF HAWAII, DEPARTMENT OF LAND & NATURAL RESOURCES	
Division of Forestry & Wildlife	
Hilo Branch	974-4227/4384
Kamuela Branch	887-6063
WAIKII RANCH	885-4884
PARKER RANCH	885-7311

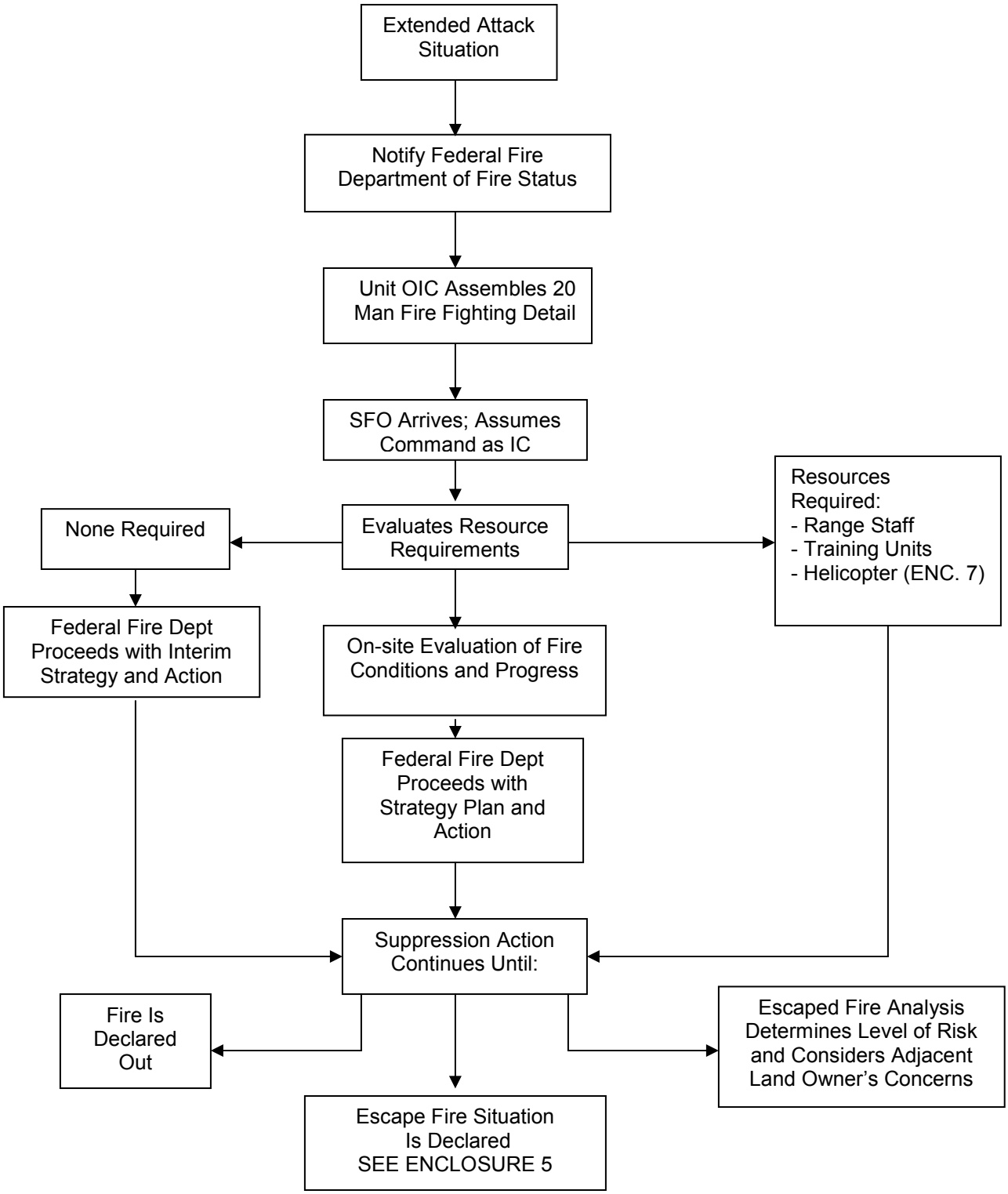
ENCLOSURE 3

POHAKULOA TRAINING AREA (PTA)
OPERATIONAL DECISION CHART
INITIAL ATTACK PLAN



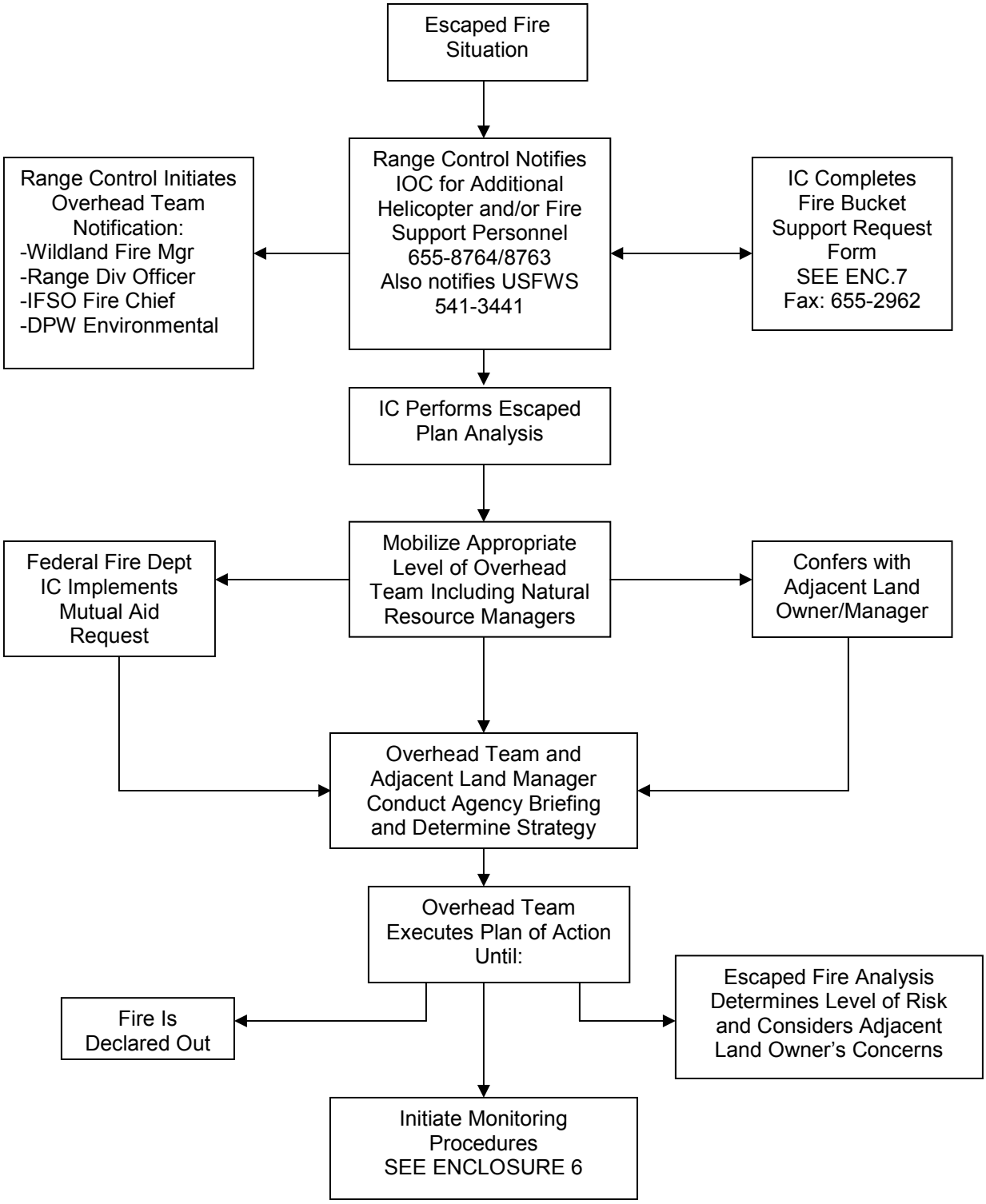
ENCLOSURE 4

POHAKULOA TRAINING AREA (PTA) OPERATIONAL DECISION CHART A, EXTENDED ATTACK PLAN



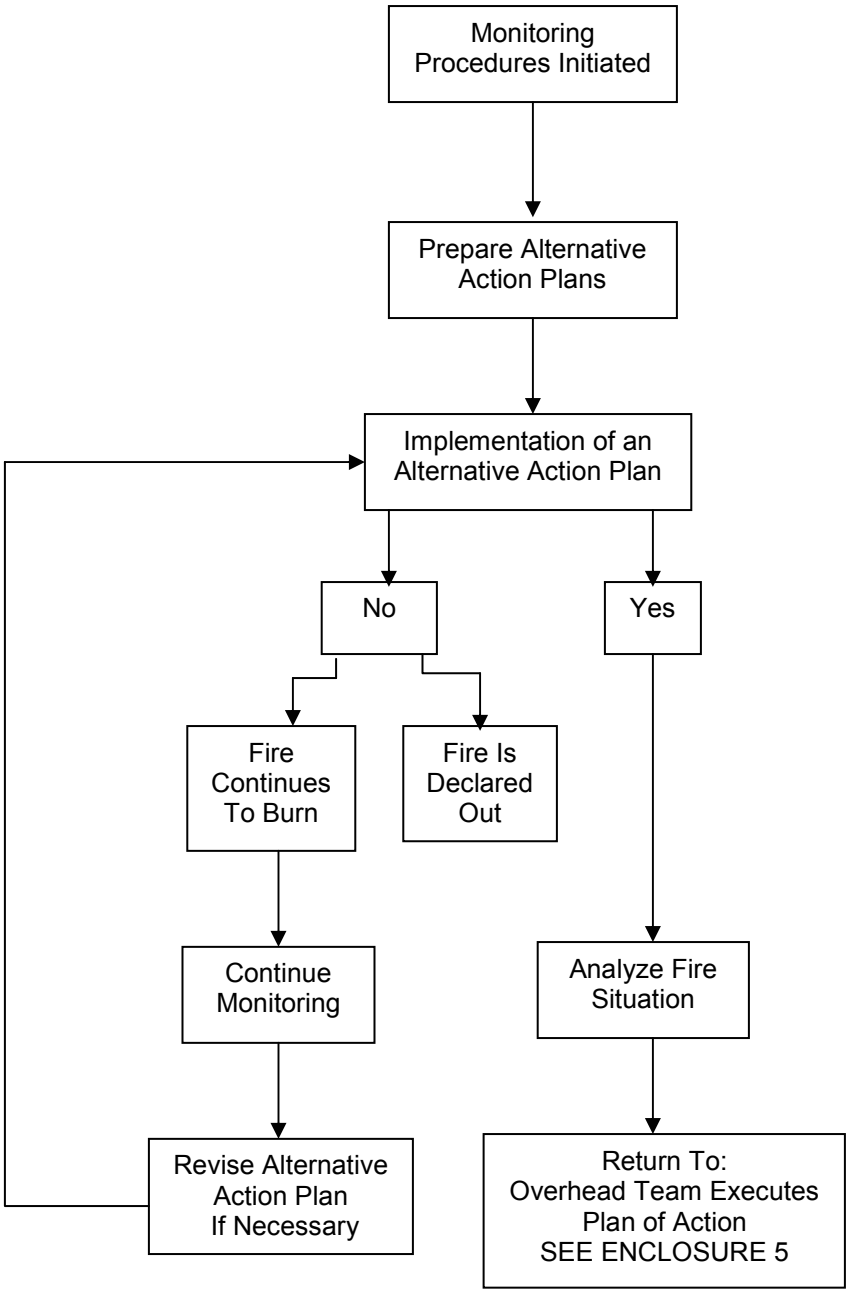
ENCLOSURE 5

POHAKULOA TRAINING AREA (PTA)
OPERATIONAL DECISION CHART B
ESCAPE FIRE SITUATION



ENCLOSURE 6

POHAKULOA TRAINING AREA (PTA)
OPERATIONAL DECISION CHART C
MONITORING PROCEDURES
(FIRES OUT OF CONTROL BEYOND PTA BOUNDARY)



ENCLOSURE 7

25th ID(L) & USARHAW Reg 350-1

Request for Rotary Wing Aircraft Support

Date of Request:

REQUEST FOR ROTARY-WINGED AVIATION SUPPORT Proponent of this Form is G3, 25 ID(L) May 97		1. Late Request? Yes / No If Yes, Letter Incl? Yes / No
2. Requesting Unit:	3. POC and Ph# or Freq and Call Sign:	4. Submitted or Coord at AMAC/G3 Conf ?____ If Yes, Date:
5. Date(s) Required: 5a. Unit's Cycle:	6. Number and Type of Aircraft Requested: 1x UH 60	7. MSC or SEP BN S3 AIR:
8. Pick-Up Point(s)/PZ(s):	9. Destination(s)/LZ(s):	
10. Contact at PZ:	11. Contact at LZ:	
12. Pick-Up Time:	13. Release Time:	
14. Passengers:		
15. Cargo: (type, number, weight)		
16. Special Instructions or Mission Equipment: (e.g. Headphones, Cargo Hook, C2 A/C etc.)		
17. Mission Description: (who, what, when, where, why)		
18. Initial Planning Coordination: (when and where)		
AVIATION USE ONLY		
19. Mission Received From: (name, unit, date, time)		20. Mission Number
21. Mission Passed To: (name, unit, date, time)		
22. Mission Passed To: (name, unit, date, time)		
23. Mission Passed To: (name, unit, date, time)		
24. Number of Aircraft Assigned to Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
25. Estimated Number of Hours for Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
26. Remarks:		

ENCLOSURE 8

FIRE DANGER RATING SYSTEM (FDRS) FOR PTA

RAWS Station	Training Area	Fuel Model	FIRE DANGER RATING (BI)				
			LOW	MODERATE	HIGH	VERY HIGH	EXTREME
PTA East	1-6, 21	F	1-24	25-32	33-41	42-58	59+
PTA Portable	7-17	L	1-21	22-30	31-37	38-54	55+
PTA Kipuka Alala	23	F	1-19	20-29	30-36	37-50	51+
PTA West	18-20, 22	N	1-34	35-54	55-66	67-84	85+
PTA Kipuka Alala	Impact Area	C	1-17	18-26	27-36	37-48	49+
PTA West	Keamuku	N	1-34	35-54	55-66	67-84	85+

FDRS Training Restrictions

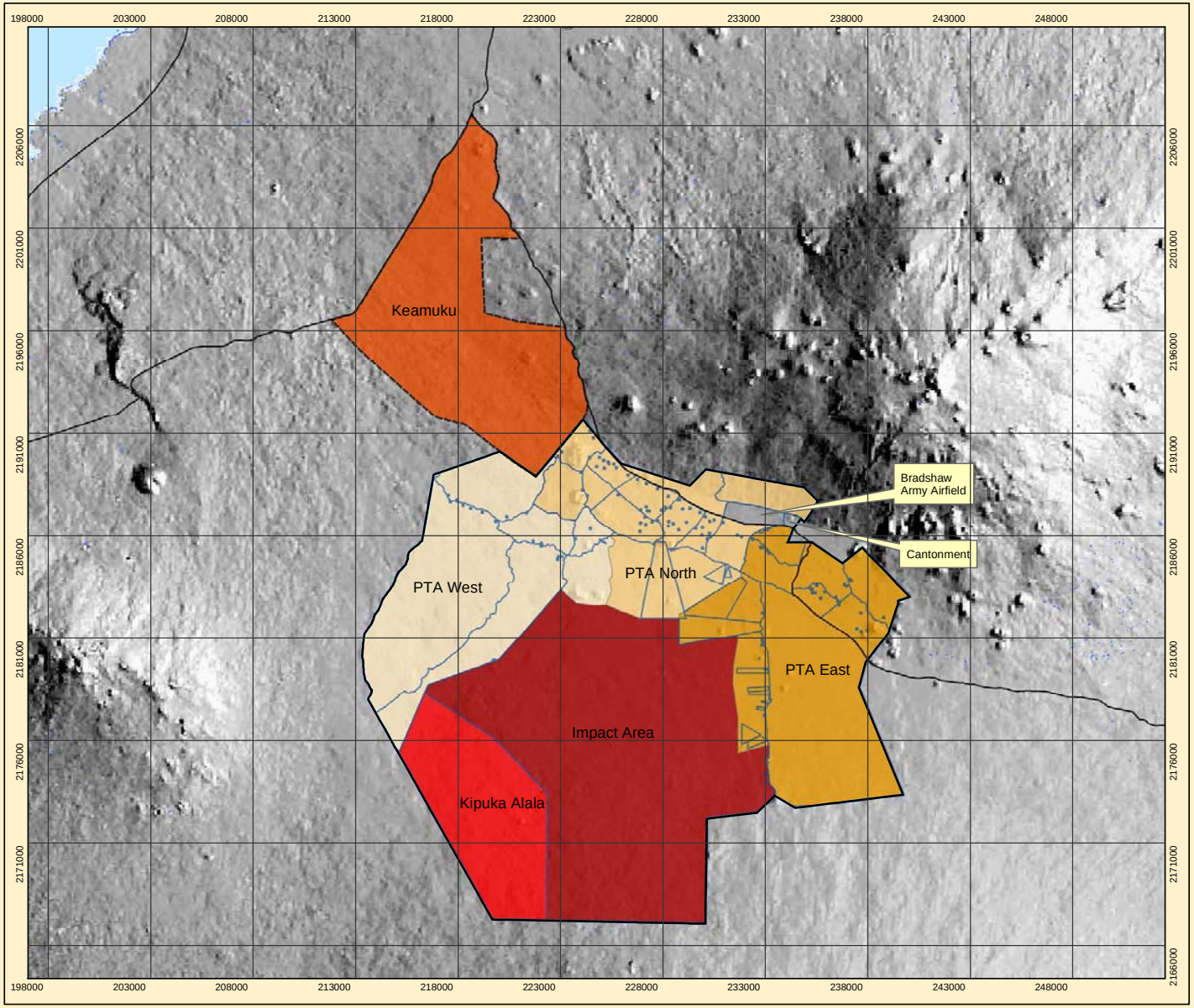
FIRE DANGER	TRAINING RESTRICTIONS
LOW	None
MODERATE	None
HIGH	No Tracers, WP.
VERY HIGH	No Pyrotechnics, smoking, or cooking/warming fires.
EXTREME	No Live-fire except ball and blank munitions. Ball and blanks allowed only at fixed ranges. Maneuver training limited to fixed ranges, TAs 7-9, 12-16, 21

Wind Restrictions for Pyrotechnics

FACTORS	RULES FOR PYROTECHNICS FIRED INTO:		
AVERAGE WIND SPEED (knots)[1]	IMPACT AREA	TRAINING AREAS	FIXED RANGES
0-10	Pyrotechnics allowed in Areas E and W[2]	Blank Ammunition and simulators allowed except in Palila Critical Habitat and Endangered Plant Habitats.[3]	Pyrotechnics allowed in Area E.
11-15	Pyrotechnics not allowed Area W. Pyrotechnics allowed in Area E.		
16-20		Pyrotechnics not allowed. Blank ammunition only in cleared areas.	Pyrotechnics not allowed in Area E.
>20	Pyrotechnics not allowed in Area E and W.		

[1] Average wind speed is obtained from PTA Range Control.
[2] Area E = Impact Area which lies east of a line between grid coordinates 2175 and 3084; Area W = Impact Area west of the same line. See map in Appendix 3 to the PTA External SOP.
[3] Aerial signal flares and hand-held illumination pyrotechnics are not to be fired into any training areas or fixed ranges, unless for emergency purposes.

(This Page Intentionally Left Blank)



Pohakuloa Training Area
Fire Danger Rating Areas

Figure PTA - 3

Legend

Fire Danger Rating Areas

- Bradshaw Army Airfield
- Cantonement
- Impact Area
- Keamuku
- Kipuka Alala
- PTA East
- PTA North
- PTA West

- Installation Boundary
- Keamuku Parcel
- Training Areas

- Surface Water Body

- Primary Roads

N

1:200,000

0 2,500 5,000 Meters

0 2.5 5 Miles

Data Source: CEMML 2003
USFS

ENCLOSURE 9 WILDLAND FIRE INCIDENT REPORT

WILDLAND FIRE INCIDENT REPORT

25TH ID(L) & USARHAW

1. INSTALLATION	2. INCIDENT NUMBER (YY-000)

3. DATE (YYMMDD)	4. FIRE LOCATION (Grid Coordinates 6 digits only)	5. RANGE OCCUPIED BY UNIT
	EJ	

6. TIME FIRE REPORTED	7. TIME FIRE OUT	8. TIME RANGE OPS RESPONDED	9. TIME FIRST SFO AT SCENE

10. AGENCY NOTIFICATION (*If applicable*)	PHONE	TIME CALLED	AT SCENE	REMARKS
❑ FEDERAL FIRE DEPARTMENT	471-7117			
❑ G3/RDH WILDLAND PROGRAM MGR	286-5818			
❑ INSTALLATION OPS CENTER (IOC)	655-8763			
❑ RANGE OFFICER	655-1404			
❑ RANGE OPERATIONS SUPERVISOR	655-9509			
❑ DPW NATURAL RESOURCE MGR	656-2878			
❑ U.S. FISH & WILDLIFE SERVICE	541-3441			
❑ (Other)				
❑ (Other)				

11. FIRE DANGER RATING	BURN INDEX (BI)	15. FIRE ESCAPE ANALYSIS	CHECK ONE	
			YES	NO
❑ GREEN ❑ YELLOW ❑ RED	13. EST. ACRES BURNED?	15a. FIRE STARTED OUTSIDE FIREBREAK ROAD?		
	14. > 10 ACRES? (AAR)	15b. FIRE ESCAPED FIREBREAK ROAD?		

16. HELICOPTER SUPPORT	16b. Aircraft Call Sign	Tail No.	16c. Arrived On Scene	Departed
☐ UH-60 ☐ CH-53 ☐ CH-46 ☐ CH-47 ☐ OTHER				
16a. BUCKET SIZE (*BAMBI*) ☐ 240-Gal ☐ 660-Gal ☐ 2000-Gal ☐ Other				

17. FIRE CAUSE (*Narrative*)	18. AMMUNITION TYPE	19. WEAPON SYSTEM
	❑ Tracer ❑ Mortar ❑ Artillery ❑ HE / WP ❑ Pyrotechnics ❑ Grenade ❑ Demo / Mines ❑ Other	❑ AT-4 ❑ TOW ❑ SAW / M-16 ❑ SMAW ❑ LAW ❑ Rocket / Missile ❑ M240/M60 ❑ Other

20. TRAINING UNIT	21. UNIT OIC	22. TELEPHONE	23. AAR REQUIRED?

24. REMARKS
(Narrative)

25. FIRE REPORT COMPLETED BY:	DATE	26. FIRE REPORT REVIEWED BY:	DATE

WILDLAND FIRE INCIDENT REPORT FORM
GENERAL INSTRUCTIONS

PURPOSE AND USE: Used in the administration of the Wildland Fire Management Program. The purpose of this form is to document all wildfire incident(s) on Army training lands under the jurisdiction of the 25th ID(L) and USARHAW within the state of Hawaii. This form will also be used to document when Army assets respond to any wildland fire incident outside of its jurisdiction in support of mutual aid requests. Documentation of all wildfires is necessary to ensure accurate fire history and trend analysis to assist fire managers in future fire management planning. The form becomes part of the permanent record file for each Fire Management Area (FMA). Fire records may be kept on an automated computer database as part of long term land management records. n

DISPOSITION OF FILES: The maintenance and disposition of all wildland fire incident reports shall be in accordance with Army record management policy. Disposition: a) OCE: Destroy after 25 years in CFA. b) Other Offices: Destroy after 5 years.

PROPONENCY: The proponent of this form is the Installation Fire & Safety Office (IFSO). Action Officer is the Wildland Fire Program Manager.

COMPLETION INSTRUCTIONS

Item 1 - Enter appropriate name of military installation where the fire occurred.

Item 2 - Fill in incident number. Enter 2 digit calendar year followed by 3 digits in numbered in sequence for the number of fires occurred during that calendar year.

Item 3 - Enter date of incident. Year, month, day (YYMMDD).

Item 4 - Fire location. Enter 6-digit grid coordinates that indicate where the fire started. Provide 6-digits only in blocks provided. *(Right, then Up)*

Item 5 - Enter range, firing point, or maneuver area the training unit causing the fire occupied at the time the fire started.

Item 6 - Enter the time of day the fire was first reported to Range control.

Item 7 - Enter the time of day the fire was reported extinguished.

Item 8 - Enter the time of day the first Range control fire crew/unit responded to the fire location.

Item 9 - Enter the time of day the first Range control fire crew/unit arrived at the fire scene.

Item 10 - Notification. Enter the time of day that Range Control first notified each agency or individual listed and enter the time each agency or individual arrived at the fire scene.

Federal Fire Dept:	Must be notified of all fires.
Wildland Fire Mgr:	Must be notified of all fires.
Installation Ops Ctr:	Notified if helicopter support or additional fire assets are required.
Range Officer:	Notified of all major fires only.
Range Ops Supv:	Must be notified of all fires.
Natural Res Mgr:	Notified if fires are potential threat to T&E plant or animal species.
USFWS:	Must be notified of all fires that escape firebreak road or installation boundary.
Remarks:	Enter appropriate comments if any.

Item 11 - Enter daily Fire Danger Rating.

Item 12 - Enter current Burn Index (BI) at the time of the fire start.

Item 13 - Enter total estimated number of acres destroyed by fire.

Item 14 - Enter YES if fire area is greater than 10 acres. The training unit OIC must submit an After-Action-Report (AAR) if fire area exceeds 10 acres. OIC must complete the AAR before clearing the range.

Item 15 - Fire Escape Analysis.
15a. Check Yes or No if fires started outside firebreak road.
15b. Check Yes or No if fires escaped the firebreak road.

Item 16 - Helicopter Support. Enter type of aircraft used on fire.
16a. Enter fire bucket size used on fire.
16b. Enter aircraft call sign tail number. (i.e., Hillclimber 150)
16c. Enter time of day aircraft arrived on scene and time aircraft departed.

Item 17 - Fill in narrative form any information as to the cause of the fire, ignition sources, or item known to have started the fire. DO NOT speculate. Validate with training unit OIC. Conduct fire investigation as required.

Item 18 - Indicate ammunition type used that caused the fire.

Item 19 - Indicate weapon system used that caused the fire.

Item 20 - Enter name of training unit that caused the fire.

Item 21 - Enter name of the OIC responsible for the training unit.

Item 22 - Enter the telephone number of the OIC of the training unit where he may be contacted in the event additional information is required.

Item 23 - Indicate if an AAR is required. If yes, AAR must be completed by the unit OIC and submitted to Range control prior to release or range clearance.

Item 24 - Remarks. Enter appropriate comments pertaining to subject wildfire incident, if any.

Item 25 - Enter date and name of individual filling out the fire report.

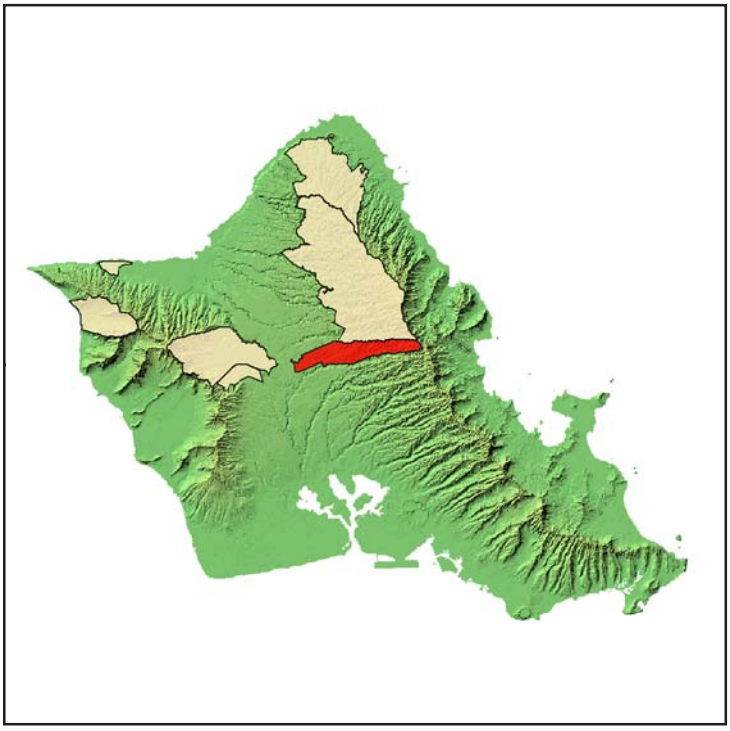
Item 26 - Enter date and name of the range supervisor reviewing the fire report. Range supervisor will review all fire incident reports for adequacy prior to submission to the wildland fire program manager.

FAX INSTRUCTIONS

A COPY OF ALL FIRE REPORTS WILL BE FAXED TO THE WILDLAND FIRE PROGRAM MANAGER WITHIN 24 HOURS AFTER THE FIRE INCIDENT IS REPORTED. ALL ORIGINAL WILDLAND FIRE INCIDENT REPORTS WILL BE MAINTAINED IN THE CURRENT FILE AREA OF EACH RESPECTIVE RANGE CONTROL OFFICE. A MAP MUST BE ATTACHED TO THE FIRE REPORT THAT IDENTIFIES AREAS BURNED.

SCHOFIELD BARRACKS EAST RANGE

STANDING OPERATING PROCEDURES



SCHOFIELD BARRACKS EAST RANGE WILDFIRE SOP

1. GENERAL.

1.1. Purpose.

The purpose of this Standing Operating Procedure (SOP) is to provide specific requirement that delineates the responsibilities of the Army, Federal Fire Department, Range Control, and using training units in the prevention and suppression of wildland fires at Schofield Barracks East Range (SBER). Its primary objective is to prevent unplanned ignitions through sound preventive measures. It also establishes procedures toward fire control and the protection of natural/cultural resources from wildfires. See Figure SBER-1 for an overview.

1.2. Scope and Applicability.

a. The provisions outlined in this SOP are applicable to all military training units and personnel assigned to or utilizing SBER. The installation commander and senior unit commanders, regardless of service or component, whose unit has been allocated the use of the maneuver training areas at SBER, will ensure compliance with this SOP.

b. All officers and noncommissioned officers will familiarize themselves with the contents of this SOP or receive a fire prevention briefing prior to use of the range facilities. Considering the potential adverse effects of wildland fires, it is imperative that awareness on the part of all commanders is maintained and that all persons are instructed in fire prevention and fire suppression.

c. It is the intent of this SOP that all persons are made so aware, and that the instructions and guidance contained herein are employed with a view towards accomplishing training with an absolute minimum of unwanted fires.

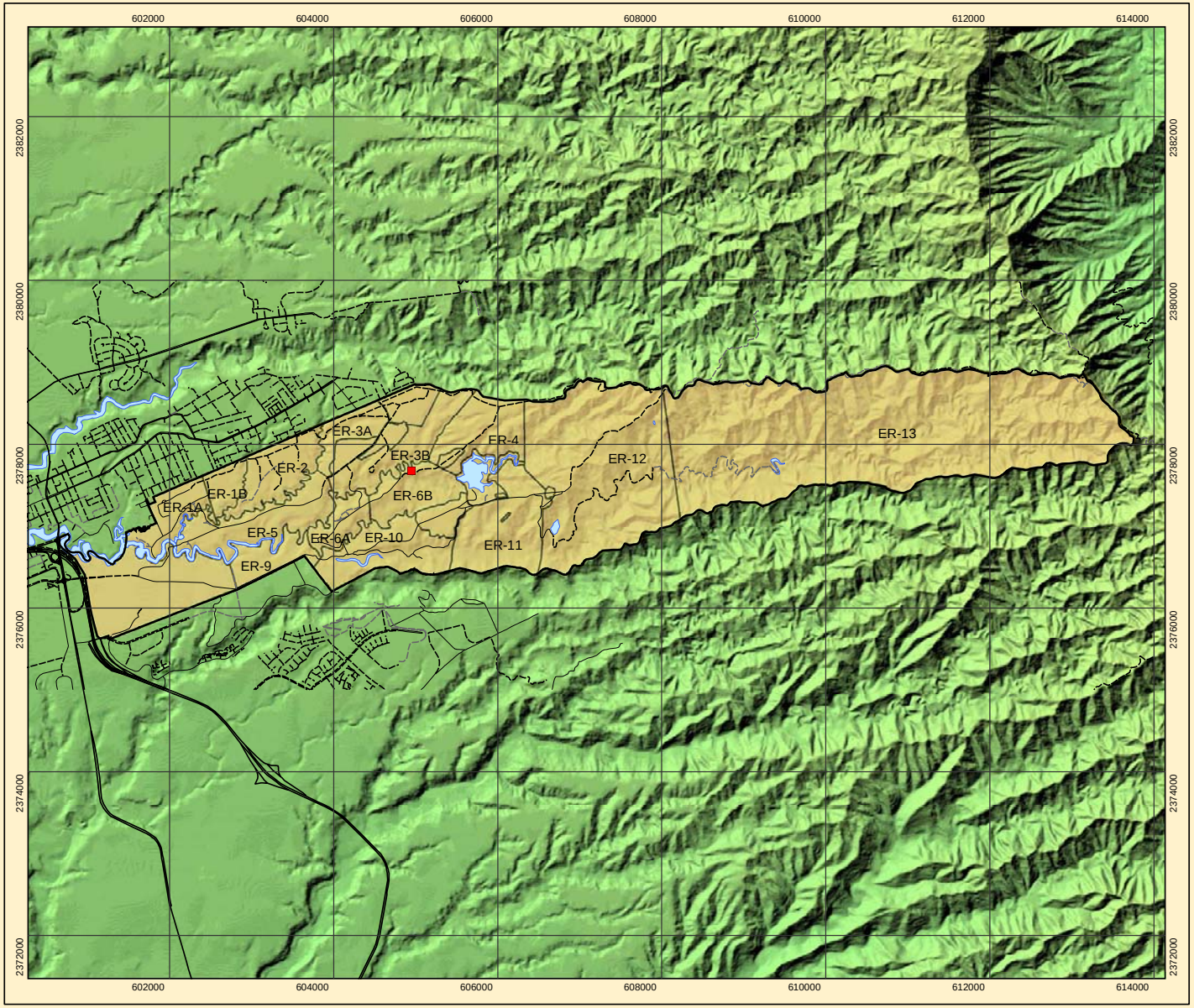
1.3, Responsibilities.

a. Installation Commander. The Installation Commander has the overall responsibility for fire prevention and protection requirements and environmental management at SBER.

b. Director of Installation Fire and Safety Office. The Director of Installation Fire and Safety has overall responsibility for the wildland fire management program.

c. Fire Chief, Federal Fire Department (FFD). The installation Fire Chief is responsible for the organization, supervision, and management of all aspects of the fire prevention and protection program in accordance with the provisions of DoDI 6055.6, Fire Protection.

(This Page Intentionally Left Blank)



Schofield Barracks East Range
Fire Suppression Resource Locations

Figure SBER - 1

Legend

- Installation Boundary
- Training Areas
- Surface Water Body
- Remote Automatic Weather Station

Roads

- Primary
- Secondary
- Tertiary
- Unimproved

N

1:50,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: USARHAW IFSO

d. Range Officer, G3/DPTM, Range Division Hawaii. The Range Officer has overall responsibility for enforcing the provisions of the Integrated Wildland Fire Management Plan (IWFMP) and other applicable training directives and regulations, including restrictions on or cessation of training activities based on the day's fire danger rating.

e. Range Operations Supervisor, Schofield Barracks. The SB Range Operations Supervisor is responsible to the Installation Commander for ensuring proper fire prevention measures are taken by troops in rear areas; fires in forested and other training areas, when discovered, are promptly reported; and augment the Federal Fire Department in fighting any fires on SBER.

f. Wildland Fire Program Manager, IFSO. The Wildland Fire Program Manager is responsible for the execution of the Army's wildland fire program. Collaborates with other resource managers, FFD and other cooperative fire agencies to ensure that supplies, equipment, training, and qualified personnel are available to meet the goals and objectives of the IWFMP.

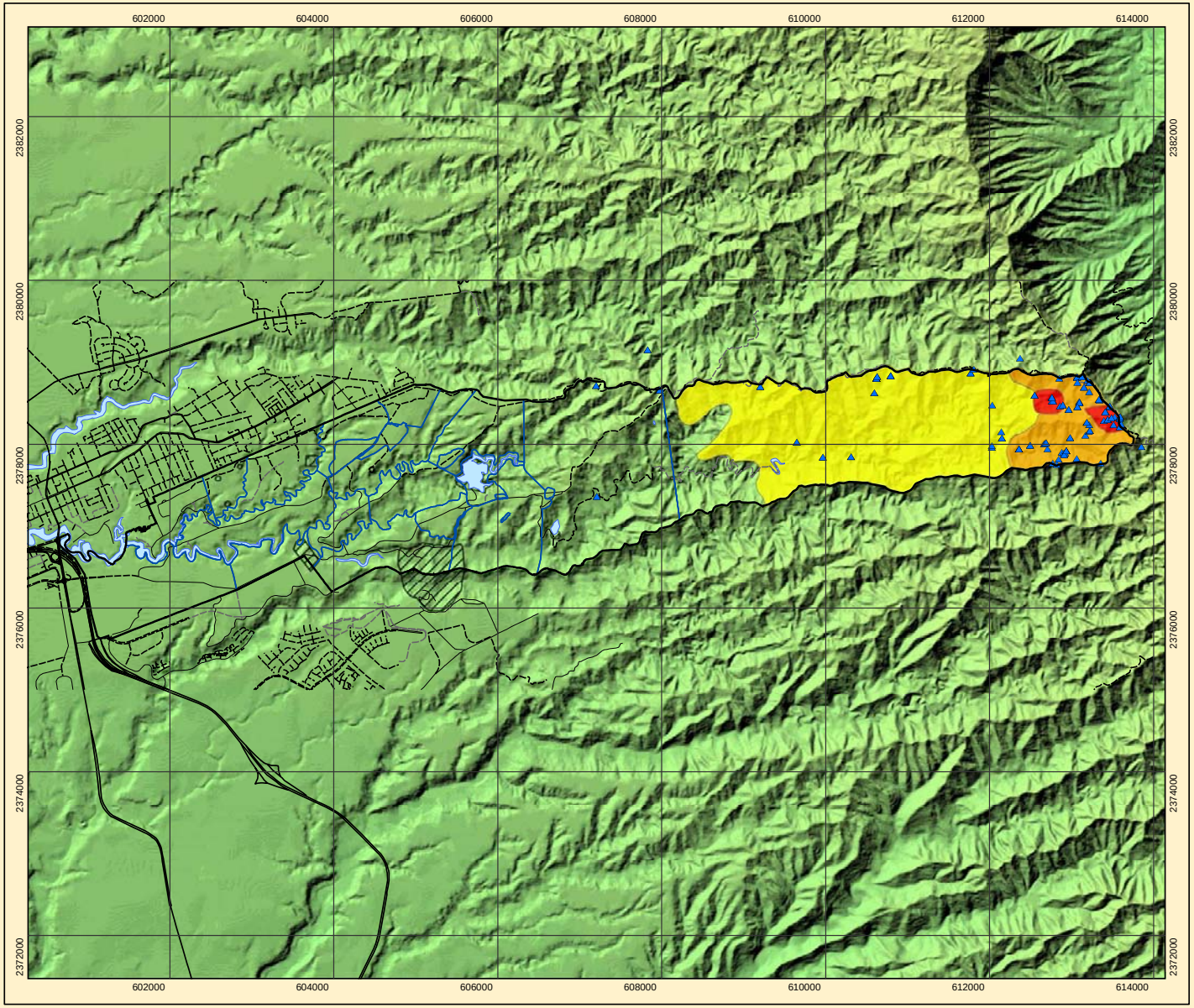
g. Unit Commanders and Division Chiefs. Commanders, managers, and supervisors at all levels of the organization are responsible for ensuring unit personnel are familiar with and comply with the provisions of this SOP and applicable regulations, fire prevention restrictions, training activities within biologically sensitive areas, providing qualified personnel to support the wildland fire management program.

1.4. Environmental Considerations.

a. Wildland Fires. Wildfires pose significant risks to threatened and endangered species of plants and animals and their native habitat. These habitats are located throughout the training ranges and adjacent to the SBER installation boundary (see Figure SBER-2). Cultural resources, including known archaeological sites, are also found within the installation. Significant threats to the archaeological sites at SBER have generally been identified as explosive ordnance detonation, maneuvering activities, unmonitored ground disturbing activities, and vegetation clearance. Fire is also a potential threat to archaeological sites from fire suppression activities.

b. Applicable environmental laws mandate the protection and conservation of natural/cultural resources. The use of various ammunitions, weapon systems, pyrotechnics, vehicles, and the presence of humans all increase the risk of wildfire which is one factor that can destroy native habitat. Although no live-fire activities are authorized on the East Range, in the past, fires have occurred at SBER as a result of military training activities and/or maliciously set fires. The continued use of Army training lands in Hawaii greatly depends upon the Army's ability to reduce the number of fire starts and control fires within the installation boundary.

(This Page Intentionally Left Blank)



Schofield Barracks East Range
Protected Resources

Figure SBER - 2

Legend

Biological Sensitive Areas

- BSA-1
- BSA-2
- BSA-3

- Sensitive Archeological Areas
- Federally Listed Species
- Installation Boundary
- Training Areas
- Surface Water Body

Roads

- Primary
- Secondary
- Tertiary
- Unimproved

N

1:50,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.

USAG HI DPW 2003.

2.1 FIRE PREVENTION.

a. One of the primary objectives of this SOP is to integrate fire management actions with military training requirements and range operations. The prevention of fires is the responsibility of every individual training and/or working at SBER.

b. Fire prevention and the ability to control the spread of fires is critical for the continued survival of endangered plants, animals and native ecosystems, and the Army's continued use of the area for military training activities. Currently, there are many instance where military operations conflict with the management of these special natural resources. These conflicts often result in reduced training capability as "WILDLAND FIRES STOP TRAINING". Fire management actions are designed to reduce existing conflicts between necessary military training activities and the conservation of natural and cultural resources found within SBER.

2.1. Education.

a. Soldiers will be briefed prior to training about fire prevention, and cultural and natural resource protection. The fire prevention briefing ensures that important information is provided to using individuals that may start wildfires.

b. Signs will be posted throughout various areas as reminders of prevention and awareness of the Fire Danger Rating System (FDRS).

c. The Integrated Training Area Management (ITAM) and Directorate of Public Works (DPW), Environmental Conservation Offices will provide training units with informational brochures to increase public and soldier awareness of the threat that wildfires pose to natural resource values.

2.2. Enforcement.

a. Enforcement of fire prevention and training policies is key to the success of an effective wildfire management program. Regulation amendments pertinent to fire may eventually become necessary to meet the concerns generated by future increase in public and military use activities and/or changes in existing conditions.

b. The primary responsibility for enforcement of range directives falls on Range Control.

c. Secondary responsibility rests with the using unit commanders.

d. Failure to follow range protocols will result in termination of scheduled training and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

2.3. Engineering.

a. There are currently no plans for any projects at SBER.

b. Engineering projects on SBER training areas shall be reviewed by the Wildland Fire Program Manager to ensure that fire prevention measures are considered during design, construction, or alignment of new ranges. Coordination with the G3/DPTM, Range Planner on engineering activities is essential to eliminate potential conflicts as related to fire prevention and fire safety.

c. An annual work plan identifying fire management projects by priority will be developed. This process will ensure that these projects (i.e., prescribed fire, maintenance of firebreak roads, herbicide, etc.) can be completed and will eliminate any conflicts between required maintenance of the ranges and military training activities.

2.4. Ignition Control.

a. All training will be subject to the fire danger rating system (see Section 3.1 and Enclosure 4 of this SOP).

b. While training at SBER, units must use extra caution during training exercises. Soldiers must be aware of and adhere to fire danger-rating restrictions. Strict compliance with training restrictions set forth in the Range SOPs and herein will reduce the number of fire starts.

3. PRE-SUPPRESSION ACTIONS.

3.1. Fire Danger Rating System.

a. Schofield Barracks Range Control is responsible for retrieving weather data from the RAWS located at ER-3B and archiving it into the WeatherPro software program. The Burn Index (BI), as determined by the National Fire Danger Rating System (NFDRS), will be used to rank fire danger to determine restrictions on pyrotechnic use, if any, in the maneuver training areas, and/or fixed training .

b. BI's will be monitored hourly by Range Control when training exercises are scheduled at SBER. Range control will notify the training unit of any training restrictions being imposed as a result of unfavorable fire danger ratings. Additionally, at any time that the BI changes from one category to another, the training unit will be notified immediately.

c. While training at SBER, units must use caution during training exercises. Soldiers must be aware of and adhere to fire danger-rating restrictions of incendiary ammunition, pyrotechnics, smoking, and other ignition sources (see Enclosure 8). Strict compliance with training restrictions set forth herein will reduce the number of fire starts. The SBER Fire Danger Rating System is as follows:

Flame Length (ft)	***Burning Index***	***Fire Index Color***
0-11	0-30.9	Green
11+	31+	Red

d. Only two fire danger categories are necessary at SBER. All munitions approved for use at SBER are authorized under the Green Fire Index. All munitions, as well as smoking, and cooking/warming fires are prohibited under the Red Fire Index. For a full list of restrictions, see Enclosure 8 of this SOP.

e. Range Control approval and guidance must be obtained prior to occupying the maneuver areas. The OIC in charge of the training unit will allow training to commence only after ascertaining the fire danger rating in effect and adopting the appropriate fire prevention measures.

3.2. Minimum Staffing Requirements.

a. Proper staffing and fire response of the FFD shall be in accordance with DODI 6055.6, Fire Protection Program.

b. An auxiliary wildland fire fighting force (Range Control) augments the FFD as first responders during initial attack operations on training ranges. At a minimum, wildland fire operations require two (2) trained Range Control personnel for each HMMWV response. This requirement is based on FFD response time from Station 14 and Station 15, located at Wheeler Army Airfield and Schofield Barracks and the safety and complexity of the fire fighting organization during initial/extended attack operations.

c. The Range Operations Supervisor will arrange work schedules to allow flexibility while ensuring that minimum staffing levels are met at all times, to include overtime authorizations. In the event of a fire, fire fighting duties take precedence over other work assignments.

3.3. Training.

a. Policy requires that all Range Control and fire department personnel engaged in suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG). The Army's wildland fire program manager will coordinate with the FFD and Range Control staff to develop a certification-training program.

b. Individuals will not be assigned to duties for which they lack training and/or certified experience. All Range Control and fire department personnel dispatched or assigned to wildfires or prescribed fires will be qualified for the fire position assigned, unless assigned as trainees and under direct supervision of higher qualified personnel at all times.

c. The Wildland Fire Program Manager will administer and manage an effective qualification and certification program. He will monitor all employees' wildland fire management development (training and experience) to ensure accurate qualification and certification standards. All personnel engaged in wildland ground fire fighting activities must satisfactorily complete the following suppression skills courses as a minimum: S-110, Basic Fire Suppression Orientation; S-130, Firefighter Training; S-190, Introduction to Fire Behavior; and I-100, Introduction to Incident Command System (ICS).

d. The Army's Wildland Fire Program Manager will coordinate with the FFD training officer to develop the annual wildland training schedule. A recurring proficiency program will include quality instruction and evaluation of employee's proficiency level through quarterly training exercises that are monitored by the fire department training officer.

3.4. Fire Equipment and Supplies.

a. If at any time the required fire suppression equipment is not operational, training at SBER will be suspended until all equipment is operational. Live-fire training will only be conducted when fully trained/certified personnel and well functioning equipment is available for fire suppression. This requirement pertains to all types of fire fighting equipment, water resources, and personnel, not just helicopter support.

b. The Wildland Fire Program Manager will maintain a cache of fire equipment in a constant state of readiness located at Building 1029, Area X, SBMR. The fire cache will contain a supply of fire hand tools, chainsaws, pumps, forestry hose, foam concentrate, etc., necessary to support fire suppression activities.

c. The Wildland Fire Program Manager will conduct periodic checks to ensure all resources are in place and will identify and immediately correct any deficiencies. Range Control shall coordinate with the Army's Wildland Fire Program Manager for equipment replacement.

3.5. Personal Protective Equipment (PPE).

a. It is mandatory that all fire fighting personnel assigned to SBMR be equipped with proper PPE (see Reference 4.2.2 of the IWFMP) necessary for combating wildfires. Range control personnel will ensure that proper PPE is worn at all times when actively engaged in fire fighting duties. Personal safety and prevention of injuries is the first priority in every fire management activity.

b. To ensure operational readiness during training exercises, range operations personnel assigned for fire fighting duties will be required to wear Nomex pants and wildland boots as part of their daily attire. This action will prevent delays and enhance response times to fire incidents at East Range.

c. PPE for training units during major wildfire incidents will be issued from the SBMR fire cache supplies. The fire cache will be maintained by the Wildland Fire Program Manager and shall be equipped to outfit a minimum of one hundred (100) firefighters with appropriate PPE.

3.6. Fire Vehicles.

a. One HMMWV from the Range Control equipped with 300-gallon slip-on pump unit (Class A foam capable) shall be assigned for initial attack response from SBMR.

b. Range control personnel operating fire response vehicles shall be qualified and licensed to operate emergency vehicles. The wildland fire program manager shall monitor vehicle qualification and training program for Range Control staff.

c. FFD response will be in accordance with FFD SOP's for wildland fire response, usually a brush company and water tender (1000-gallon capacity).

d. Range Control personnel will perform daily preventive maintenance inspection of fire vehicles and pumps to ensure operational readiness. All discrepancies shall be identified and annotated on DA Form 2404, Vehicle Discrepancy Inspection Checklist.

e. The SB Range Operations Supervisor will review all 2404's and coordinate with the Wildland Fire Program Manager. A Priority 03 and Force Activity Designator (FAD) III for replacement parts to support emergency fire equipment shall be assigned in accordance with AR 420-90, Facilities Engineering, Fire Protection, Chapter 4-7.

f. The Wildland Fire Program Manager will coordinate repairs with contracted vendors. Funding to support recurring maintenance and/or repairs shall be included in the annual Wildfire Program Management budget.

g. Water for fire fighting is available from fire hydrants at the western end of SBER or from fire fighting personnel.

3.7. Helicopter Fire Bucket Support.

a. There is no requirement to have a dedicated helicopter for fire bucket operations on site at East Range due to the type of training (non-live-fire).

b. Range Control will immediately notify the Installation Operations Center (IOC) upon determination by Range Operations Supervisor, the IC, or FFD that an extended attack situation exists and that a helicopter for fire bucket operations or additional fire fighting support is required. Refer to Fire Bucket Support Request Form, on page A-3-19 of this SOP.

c. Military helicopter units must provide their own fire buckets. Range Control currently maintains three BAMBI fire buckets [(2) 660-gallon and (1) 2000-gallon] for emergency backup use by military UH-60, CH-53, or CH-47 aircraft assigned to conduct fire bucket operations.

d. Range Control staff is responsible for ensuring that a serviceable primary and reserve BAMBI fire bucket is available for use by trained helicopter aircrews at all times. All discrepancies and the status of inoperable fire buckets will be immediately reported to Range Maintenance or the Wildland Fire Program Manager to coordinate immediate replacement or repair.

e. Until a 300,00 gallon capacity dip pond is constructed at SBMR, the helicopter crew must transient to an approved water resource site for water. The US Army has negotiated a 5-year lease with private landowners on the use of water reservoirs during training and major wildfires on Army lands. Refer to Section 5.7 of the IWFMP, Aviation Plan for all approved water reservoir locations.

f. Air-to-ground radio communication must be established with the FFD and helicopter support units involved in fire suppression activities. The capability for the IC to coordinate and direct air support with ground fire fighting crews is essential for safe and effective application. Refer to Section 5.6, Communication Plan and Section 5.7, Aviation Plan, of the IWFMP for assigned radio frequencies on Oahu.

3.8. Other Resources.

a. The U.S. Army Hawaii has entered into Cooperative Agreements and Mutual Aid Agreements with various federal, state, and local fire agencies. Refer to Appendix 2, Interagency Cooperative Agreements, of the IWFMP.

b. All agreements shall be reviewed annually and updated every five (5) years or as required.

4. FIRE SUPPRESSION ACTIONS.

4.1. Fire Reporting and Notification Procedures.

a. Early fire detection and prompt reporting is critical in having an effective initial attack of wildfires at SBER. All fires, regardless of size, will be reported immediately to Range Control and in turn, to the FFD. Units will follow the fire reporting procedures below.

b. In the event of a wildland fire on any maneuver area in SBER, the unit OIC will immediately notify Range Control by the most expeditious means possible (radio or telephone), stating the exact location (grid coordinates) and the extent of the fire. The OIC will immediately cease training and remain in the area with the unit subject to the orders of the Range Control and/or FFD when they arrive on the scene. (Refer to Reference 3, Initial Attack Plan)

c. In the event radio communication fails, training unit will use a cellular phone or locate the nearest telephone and dial 911 for immediate fire department response by City & County units in accordance with mutual aid support agreement.

d. Once a fire is reported, training units will not be allowed to resume training until the fire is extinguished or upon approval by the Range Operations Supervisor and/or SFO of the FFD.

e. Failure to report any fire will result in termination of scheduled training and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

f. Upon notification of a fire, Range Control will immediately notify the Federal Fire Department by telephone (471-7117) and provide the exact location (grid coordinates), building or range number, maneuver area, or make a reference to a prominent terrain feature (e.g. ER-4 Confidence Course, Air Assault Course, etc.).

4.2. Initial Attack.

a. Immediate and aggressive response to all fires is an unconditional recommendation for SBER. Within the confines of due care for personnel safety, the high resource values of the area justify the fullest commitment to expeditious containment and control of all fires. The difficult and often hazardous fire conditions warrant total initial effort to arrest fires in the early stages. Fiscal consideration must be secondary in ensuring timely and adequate availability of necessary fire fighting resources. In reality, the savings to be realized from a successful initial attack will offset the cost of many so called “over reactions”.

b. Upon notification of a fire by the training unit, the SB Range Control (firing desk) will notify other units training in proximity of the fire area. All other units will be placed in a “check fire” to alert units of current fire conditions and ensure awareness of fire suppression resources responding to the fire scene.

c. Trained Range Control fire crews will immediately proceed to the scene of the fire and assume command and control of all fire fighting activities. Range Control will direct fire suppression actions until properly relieved by the first arriving FFD unit. At this time, the fire will be evaluated as “Routine”, “Serious”, or “Critical”, defined as follows:

(1) Wildland Fires (ROUTINE). Wildland fires that can be handled by Range Control.

(2) Wildland Fires (SERIOUS). Wildland fires that may require the assistance of helicopters and/or military personnel under direct supervision of the FFD.

(3) Wildland Fires (CRITICAL). Wildland fires that will require the assistance of mutual aid and pose a critical threat to loss of high value resources and/or potentially may leave the SBER installation boundary.

d. The FFD will establish command and organize fire ground operations under the Incident Command System (ICS).

e. As the Incident Commander (IC), the Fire Chief or the Senior Fire Officer (SFO) will establish a command post when it is anticipated or the fire incident is of serious or critical nature.

f. In the event fire escapes the initial attack, the IC will implement an extended attack plan or fire escape contingency plan. (Refer to, Extended Attack Plan, Enclosure 4; Escape Fire Situation, Enclosure 5; and Monitoring Procedures, Enclosure 6, of this SOP).

g. Once resources have been committed to fire fighting, they are under the control of the IC. The IC directs the overall employment of auxiliary fire fighting resources to contain and extinguish the fire. This does not preclude unit commanders from rotating personnel and equipment necessary for rehab.

h. The IC will notify the Range Control and/or Installation Operations Center (IOC) when requesting military assistance for combating fires resulting from major fires. The primary mission of the unit commanders in the geographical area will shift from training objectives to fire control.

i. The use of military personnel will only be authorized under the most extreme circumstances. When utilized, military personnel will be under the control of a qualified fire department officer.

j. The IC will initiate action requesting mutual aid support from other fire agencies in accordance with established Cooperative Agreements when required.

k. Fires with potential for escape from and/or fires started adjacent to the SBER boundary that have potential to carry fire into high resource value areas on SBER justify the fullest commitment to aggressive containment and control of fires. The Army shall work with adjacent landowners to control fires before they encroach upon or escape the SBER boundary.

1. Types of Attack.

(a) Direct Initial Attack (IA). Direct initial attack by the training unit or trained Range Control staff at the onset can suppress fires at the point of origin while still small and prevent fires from spreading. However, fuel loads, and terrain conditions at SBER currently limit safe and effective direct attack by fire crews in some of the area. Ground fire fighting crews can be effective for containing, or at least retarding the spread of fires until water/retardant drops from helicopters are on line. Direct attack with helicopter water drops can be very effective. Aerial fire bucket operations will be utilized to control fire in remote areas that are inaccessible by ground fire fighting teams.

(b) Indirect Attack. Indirect attack is the use of ground crews or aircraft to create control lines in front of fires before the fire arrives. In areas with heavier fuel loads or when the fire is exhibiting intense behavior, indirect attack incorporating offset hand lines roads and pre-constructed firebreaks can be used as an approach. Backfiring or blacklining the fuels between the fire front and the control line should be avoided unless absolutely necessary.

2. Recommendation for suppression. The direct attack method is considered the best method in all locations at SBER. Hand crews, brush engines and aerial buckets can be used in most areas. Since it is desired to suppress a fire as quickly as possible using crews with hand tools and engines/buckets with water/foam directly on a fireline is recommended. Black lines/backfiring can also be established as a control measure for fuel starvation if necessary. Due to the rough terrain in portions of the installation and the presence of cultural sites, bulldozer lines are considered a last resort and should be only sited (unless used to clear old paths) with the recommendation of the DPW Environmental Division. The HUMMER Brush Engine can maneuver on all maintained roads. Water Tenders and other Type 50/60 Brush Engines should stay on the major training area roads. Structural engines/tenders should only be allowed on the center road. Muddy conditions are common in the winter months, so caution needs to be taken to avoid getting fire response vehicles stuck. Several Escape/Safety zones can be designated in open, barren areas in western SBER. There are few if any suitable locations for safety zones in eastern SBER. This needs to be taken into account if firefighters are to be deployed there.

4.3. Command and Control.

a. The FFD will establish command and organize fire ground operations under the Incident Command System (ICS) and Unified Command during multi-agency response.

b. As the Incident Commander (IC), the District Fire Chief or the Senior Fire Officer (SFO) will establish a command post when it is anticipated or the fire incident is actually of serious or critical nature.

c. Once resources have been committed to fire fighting, they are under the control of the IC. The IC directs the overall employment of auxiliary fire fighting resources to contain and extinguish the fire. This does not preclude unit commanders from rotating personnel and equipment necessary for rehab. Particular attention must be given to the increased physical demand placed on fire fighting personnel during extended attack operations.

d. The IC will coordinate with Range Control and/or training units when requesting military assistance for combating major fires. The primary mission of the unit commanders in the geographical area will shift from training objectives to fire control.

e. The use of military personnel will only be authorized under the most extreme circumstances. When utilized, military personnel will be under the control of a qualified Range Control or fire department officer.

f. The IC will initiate action requesting mutual aid support from other fire agencies in accordance with established Cooperative Agreements when required.

g. Fires in the impact area with potential for escape and/or fires started adjacent to the SBER boundary that have potential to carry fire into high resource value areas on SBER justify the fullest commitment to aggressive containment and control of fires. The Army shall work with adjacent landowners to control fires before they encroach or escape the SBER boundary.

5. POST FIRE ACTIONS.

5.1. Records and Fire Reports.

a. It is important that all fire incidents are documented to ensure accurate fire history of all fires on SBER is maintained. Fire reports are used to track location, size, cause, frequency, and for fire trend analysis for future input and use in Geographical Information Systems (GIS).

b. Range Control will maintain a log of all fires on DA Form 1594, Daily Staff Journal or Duty Officer's Log. All fire incidents will also be assigned a fire number and officially recorded on the standard Wildland Fire Incident Report form for all Army training lands. A sample Wildland Fire Incident Report (WFIR) form is included in Enclosure 9 of this SOP.

c. The Range Operations Supervisor will review all fire reports for accuracy and proper completion of the Wildland Fire Incident Report. A copy of each report will be faxed to the wildland fire program manager at the earliest opportunity. DPW Environmental will forward copies of all Fire Incident Reports on fires that escape outside the East Range boundary to the U.S. Fish & Wildlife Service (USFWS).

d. Fire records will be kept on an automated computer database and maintained by the wildland fire program manager necessary for accurate fire history and fire trend analysis. The wildland fire program manager and DPW Natural Resource Manager will coordinate submission of semi-annual fire incident reports to USFWS NLT 10 July and 10 January of each calendar year.

5.2. Surveys.

a. In addition to the reports and reviews that are completed immediately after a wildfire, a post-fire analysis survey of the burned area may be required depending on the fire's location and vegetation damaged. The post-fire analysis may be combined with any of the informal or formal investigations. A post-fire analysis will need to determine either all or part of the following:

(1) The effect the fire may have had on native or alien flora and fauna resources and cultural resources.

(2) The effectiveness of the pre-suppression measures including fuel modifications.

(3) The effectiveness of the suppression resources and measures used.

(4) The effectiveness of the ICS.

(5) The effectiveness of fire/fuel models used.

(6) A safety review of suppression actions.

(7) A UXO contamination survey or potential UXO clean up operation.

b. A post-fire survey of the fire area will be conducted with the coordination of the DPW Environmental and ITAM office.

c. The effects of fire on threatened and endangered species or effects from catastrophic events must be surveyed at the earliest opportunity.

d. If during the survey, it becomes evident that a wildfire has affected BSA/SEA, or threatened any endangered species, the USFWS and the State of Hawaii, Division of Forestry & Wildlife (DOFAW) will be notified. If military training activities were determined to have caused the wildfire, the Army will reinitiate Section 7 consultation under the Endangered Species Act (ESA).

e. If a UXO survey or clearing operation is desired, coordination with the Explosive Ordnance Disposal (EOD) unit is necessary. Surveys or clearing operations must be planned, coordinated, and should be carried out immediately after a fire.

5.3. Investigations and Accident Reporting.

a. After Action Reports (AAR) will be conducted for fires of four hectares (ten acres) or more and/or during which unusual events occurred, to include failure to follow instructions.

b. The RDH will request a formal investigation for fires involving any of the following:

(1) Training related caused fires escaping or starting outside East Range boundary.

(2) Damage or loss of valuable property exceeding $1000.00.

(3) Damage of Biological Sensitive Area (BSA) or incidental take of plant or animal specie.

(4) All entrapments of fire shelter deployments.

(5) Major injury or fire fatality.

ENCLOSURE 1 FIRE PREVENTION BRIEFING

The following verbiage will be included in a general safety, environmental and fire prevention briefing to be given to all personnel before training at SBER.

The purpose of this brief is to educate users of the range about the dangers of fire on the range. Fire prevention is the responsibility of every person working or training on the range. There are several reasons that fire prevention is so important. Fire poses a grave threat to endangered plants and animals at SBER. Fires also pose a danger of damage to archaeological sites. If a fire starts, all training in the vicinity of the fire must cease, and training downtime will result. For these reasons, every effort must be made to prevent range fires. In order to prevent fires, you must follow the following rules:

1. No lighted tobacco smoking materials will be discarded on the range. Smoking on the ranges is prohibited with the exception of on roads and other barren areas.

2. Open fires are not authorized.

3. Heat tabs and similar commercial products must be used inside metal containers.

4. The use of smoke grenades or simulators is authorized, but must be used in such a manner that will not cause fires to ignite. This means do not place smoke grenades or simulators in vegetated areas. Place them in the dirt or in metal cans provided by Range Control.

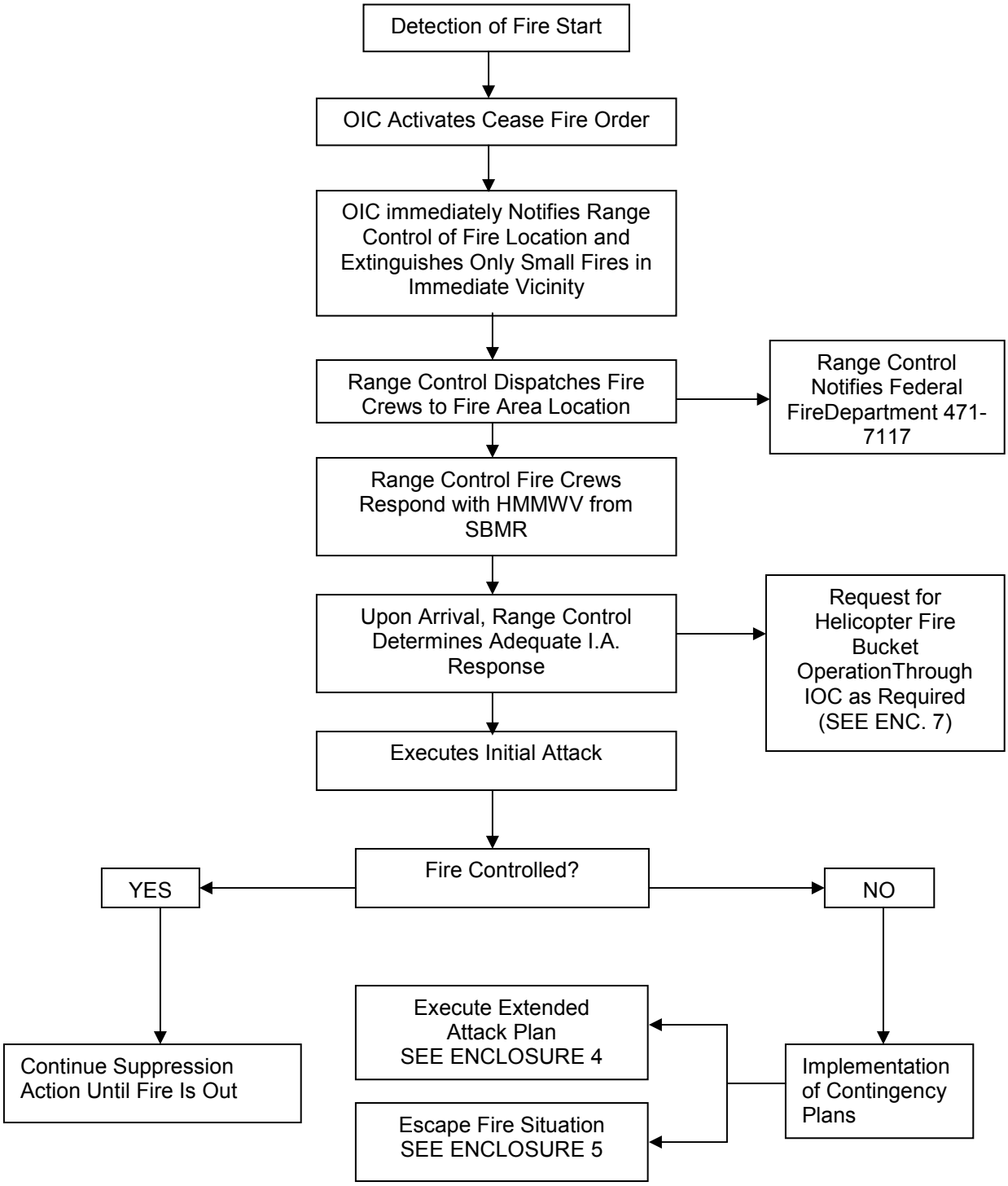
In the event a fire is started, cease training immediately. All fires, regardless of size, must be reported immediately to Schofield Barracks Range Control by radio or telephone. Every safe effort must be made to put the fire out, and to do so as quickly as possible. Every resource available on the Range must be committed to this effort. These resources include HUMMER Brush Engine fire trucks, and those of you that have been designated as part of the fire fighting team. Your unit leaders will advise you if you are on this team. In the event this fire fighting team is required, a trained safety technician will direct your work to put the fire out. The fire fighting team must be knowledgeable of safety and the proper use of backpacks and hand tools for fire fighting. When needed, this fire equipment will be issued at a designated site (Designate a site that everyone is familiar with). (demonstrate the use of water backpack and fire swatter) Water for fire fighting is available from fire hydrants at the western end of SBER or from fire fighting personnel.

ENCLOSURE 2 NOTIFICATION LIST

AGENCY NAME	PHONE NO.
FEDERAL FIRE DEPARTMENT (Emergency)	471-7117
Communications Center & Dispatch	474-2222
Honolulu Fire Department (Emergency)	911
25th ID(L) & USARHAW	
Installation Operations Center (IOC)	655-8763/8764
	655-2962 (Fax)
G3/DPTM, Range Division Hawaii	
Range Officer	655-1404
Range Operations Manager, SB	655-5243/9509
Schofield Range Control (24-hrs)	655-2292
ITAM Coordinator	655-0582/8463
Installation Fire & Safety Office	
Director	655-3350
Fire Chief	655-1331
Wildland Fire Program Manager	656-0615
	286-5818 (Cell)
DPW, Environmental Office	
Chief, Environmental	656-2878, x-1062
Natural Resource Manager	656-2878, x-1050
Cultural Resource Manager	656-2878, x-1052
Oahu Biologist	656-7641/7741
U.S. FISH & WILDLIFE SERVICE	
Field Supervisor	541-3441
Fax	541-3470
STATE OF HAWAII, DEPARTMENT OF LAND & NATURAL RESOURCES	
Division of Forestry & Wildlife	
Oahu Branch Manager	973-9787/571-9999
State Fire Protection Forester	587-4173/571-0000

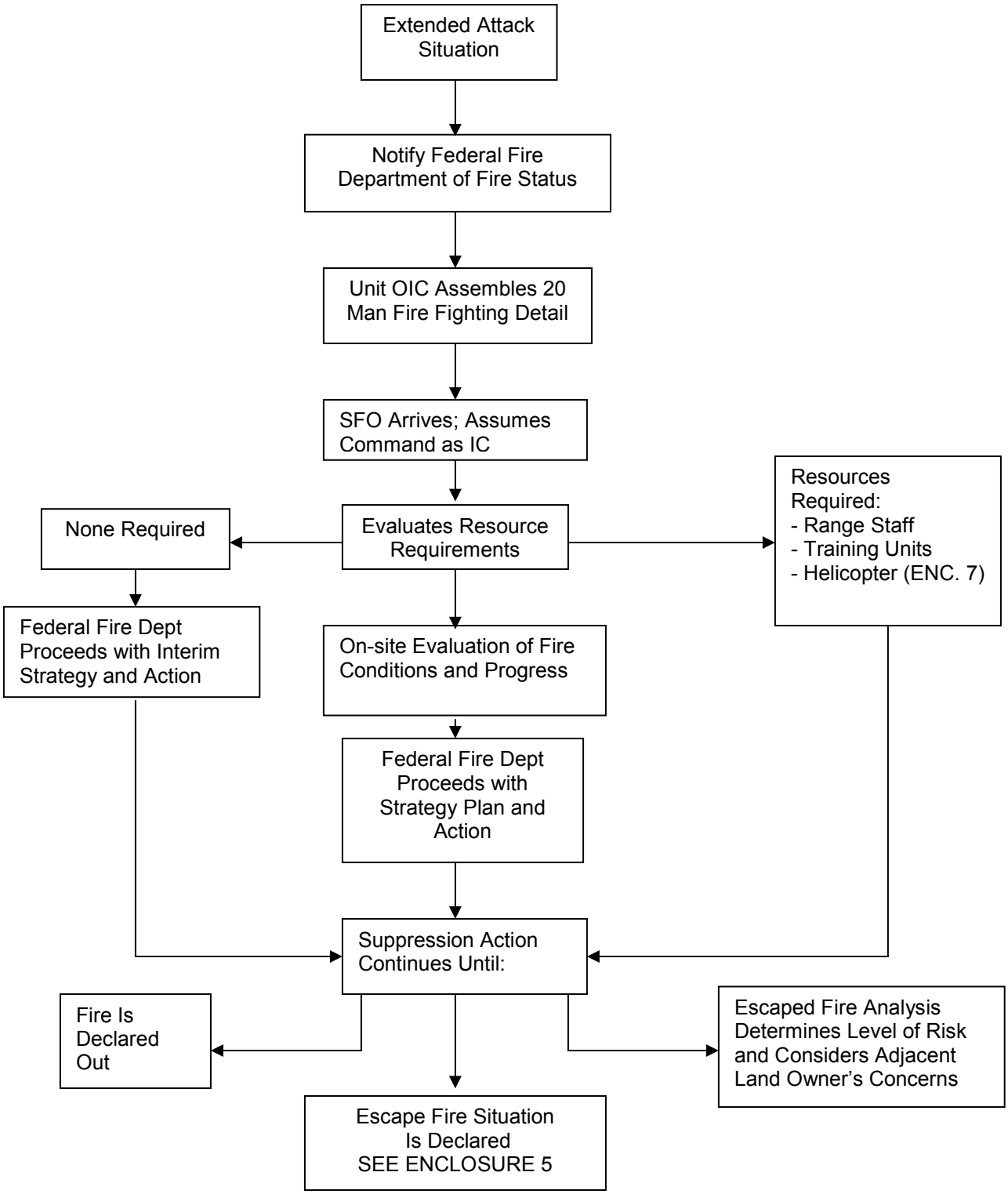
ENCLOSURE 3

SCHOFIELD BARRACKS EAST RANGE (SBER)
OPERATIONAL DECISION CHART
INITIAL ATTACK PLAN



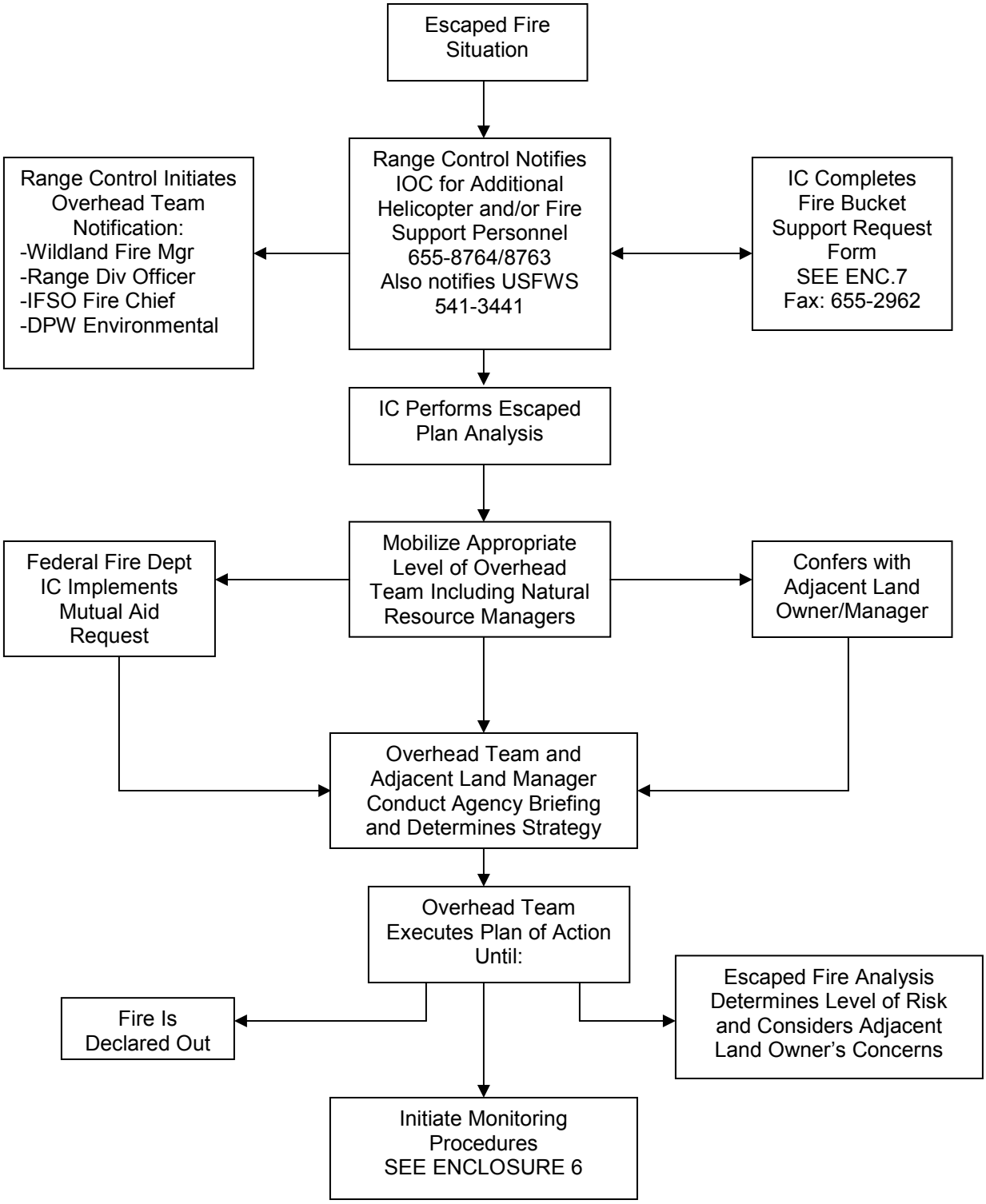
ENCLOSURE 4

SCHOFIELD BARRACKS EAST RANGE (SBER) OPERATIONAL DECISION CHART A, EXTENDED ATTACK PLAN



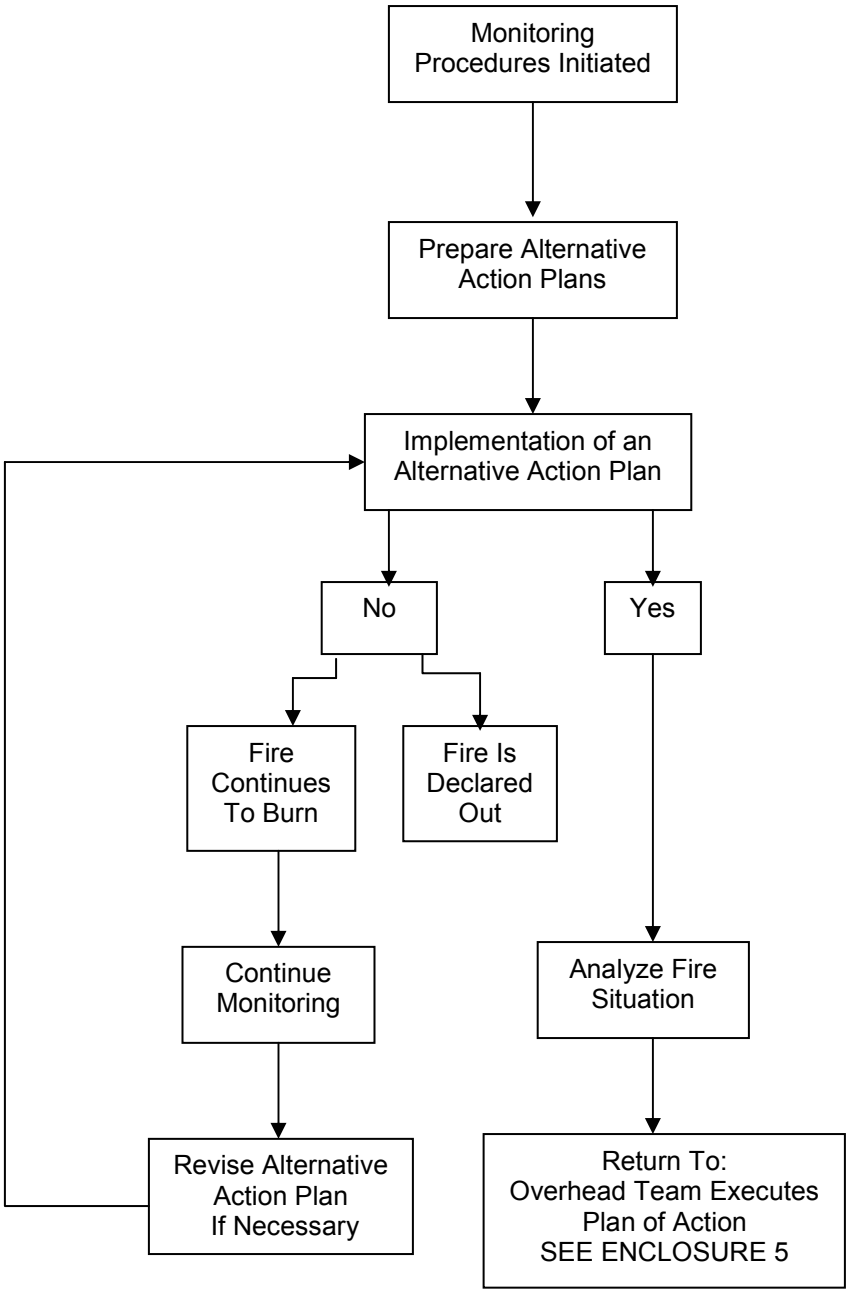
ENCLOSURE 5

SCHOFIELD BARRACKS EAST RANGE (SBER)
OPERATIONAL DECISION CHART B
ESCAPE FIRE SITUATION



ENCLOSURE 6

SCHOFIELD BARRACKS EAST RANGE (SBER)
OPERATIONAL DECISION CHART C
MONITORING PROCEDURES
(FIRES OUT OF CONTROL BEYOND SBER BOUNDARY)



ENCLOSURE 7

25th ID(L) & USARHAW Reg 350-1

Request for Rotary Wing Aircraft Support

Date of Request:

REQUEST FOR ROTARY-WINGED AVIATION SUPPORT Proponent of this Form is G3, 25 ID(L) May 97		1. Late Request? Yes / No If Yes, Letter Incl? Yes / No
2. Requesting Unit:	3. POC and Ph# or Freq and Call Sign:	4. Submitted or Coord at AMAC/G3 Conf ?____ If Yes, Date:
5. Date(s) Required: 5a. Unit's Cycle:	6. Number and Type of Aircraft Requested: 1x UH 60	7. MSC or SEP BN S3 AIR:
8. Pick-Up Point(s)/PZ(s):	9. Destination(s)/LZ(s):	
10. Contact at PZ:	11. Contact at LZ:	
12. Pick-Up Time:	13. Release Time:	
14. Passengers:		
15. Cargo: (type, number, weight)		
16. Special Instructions or Mission Equipment: (e.g. Headphones, Cargo Hook, C2 A/C etc.)		
17. Mission Description: (who, what, when, where, why)		
18. Initial Planning Coordination: (when and where)		
AVIATION USE ONLY		
19. Mission Received From: (name, unit, date, time)		20. Mission Number
21. Mission Passed To: (name, unit, date, time)		
22. Mission Passed To: (name, unit, date, time)		
23. Mission Passed To: (name, unit, date, time)		
24. Number of Aircraft Assigned to Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
25. Estimated Number of Hours for Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
26. Remarks:		

ENCLOSURE 8

FIRE DANGER RATING SYSTEM (FDRS) FOR SBER

FIRE DANGER RATING	BURN INDEX	FLAME LENGTH (FT)	CAUTION TO BE EXERCISED	RESTRICTIONS	HAZARD
GREEN	0-30.9	0-11	Use Normal Caution	No Restrictions	LOW
RED	31+	11+	Use Extreme Caution	No pyrotechnics, blank fire, smoking, or warming/cooking fires allowed.	HIGH

ENCLOSURE 9 WILDLAND FIRE INCIDENT REPORT

WILDLAND FIRE INCIDENT REPORT

25TH ID(L) & USARHAW

1. INSTALLATION	2. INCIDENT NUMBER (YY-000)

3. DATE (YYMMDD)	4. FIRE LOCATION (Grid Coordinates 6 digits only)	5. RANGE OCCUPIED BY UNIT
	EJ	

6. TIME FIRE REPORTED	7. TIME FIRE OUT	8. TIME RANGE OPS RESPONDED	9. TIME FIRST SFO AT SCENE

10. AGENCY NOTIFICATION (*If applicable*)	PHONE	TIME CALLED	AT SCENE	REMARKS
❑ FEDERAL FIRE DEPARTMENT	471-7117			
❑ G3/RDH WILDLAND PROGRAM MGR	286-5818			
❑ INSTALLATION OPS CENTER (IOC)	655-8763			
❑ RANGE OFFICER	655-1404			
❑ RANGE OPERATIONS SUPERVISOR	655-9509			
❑ DPW NATURAL RESOURCE MGR	656-2878			
❑ U.S. FISH & WILDLIFE SERVICE	541-3441			
❑ (Other)				
❑ (Other)				

11. FIRE DANGER RATING	BURN INDEX (BI)	15. FIRE ESCAPE ANALYSIS	CHECK ONE	
			YES	NO
❑ GREEN ❑ YELLOW ❑ RED	13. EST. ACRES BURNED?	15a. FIRE STARTED OUTSIDE FIREBREAK ROAD?		
	14. > 10 ACRES? (AAR)	15b. FIRE ESCAPED FIREBREAK ROAD?		

16. HELICOPTER SUPPORT	16b. Aircraft Call Sign	Tail No.	16c. Arrived On Scene	Departed
☐ UH-60 ☐ CH-53 ☐ CH-46 ☐ CH-47 ☐ OTHER				
16a. BUCKET SIZE (*BAMBI*) ☐ 240-Gal ☐ 660-Gal ☐ 2000-Gal ☐ Other				

17. FIRE CAUSE (*Narrative*)	18. AMMUNITION TYPE	19. WEAPON SYSTEM
	❑ Tracer ❑ Mortar ❑ Artillery ❑ HE / WP ❑ Pyrotechnics ❑ Grenade ❑ Demo / Mines ❑ Other	❑ AT-4 ❑ TOW ❑ SAW / M-16 ❑ SMAW ❑ LAW ❑ Rocket / Missile ❑ M240/M60 ❑ Other

20. TRAINING UNIT	21. UNIT OIC	22. TELEPHONE	23. AAR REQUIRED?

24. REMARKS
(Narrative)

25. FIRE REPORT COMPLETED BY:	DATE	26. FIRE REPORT REVIEWED BY:	DATE

WILDLAND FIRE INCIDENT REPORT FORM
GENERAL INSTRUCTIONS

PURPOSE AND USE: Used in the administration of the Wildland Fire Management Program. The purpose of this form is to document all wildfire incident(s) on Army training lands under the jurisdiction of the 25th ID(L) and USARHAW within the state of Hawaii. This form will also be used to document when Army assets respond to any wildland fire incident outside of its jurisdiction in support of mutual aid requests. Documentation of all wildfires is necessary to ensure accurate fire history and trend analysis to assist fire managers in future fire management planning. The form becomes part of the permanent record file for each Fire Management Area (FMA). Fire records may be kept on an automated computer database as part of long term land management records. n

DISPOSITION OF FILES: The maintenance and disposition of all wildland fire incident reports shall be in accordance with Army record management policy. Disposition: a) OCE: Destroy after 25 years in CFA. b) Other Offices: Destroy after 5 years.

PROPONENCY: The proponent of this form is the Installation Fire & Safety Office (IFSO). Action Officer is the Wildland Fire Program Manager.

COMPLETION INSTRUCTIONS

Item 1 - Enter appropriate name of military installation where the fire occurred.

Item 2 - Fill in incident number. Enter 2 digit calendar year followed by 3 digits in numbered in sequence for the number of fires occurred during that calendar year.

Item 3 - Enter date of incident. Year, month, day (YYMMDD).

Item 4 - Fire location. Enter 6-digit grid coordinates that indicate where the fire started. Provide 6-digits only in blocks provided. *(Right, then Up)*

Item 5 - Enter range, firing point, or maneuver area the training unit causing the fire occupied at the time the fire started.

Item 6 - Enter the time of day the fire was first reported to Range control.

Item 7 - Enter the time of day the fire was reported extinguished.

Item 8 - Enter the time of day the first Range control fire crew/unit responded to the fire location.

Item 9 - Enter the time of day the first Range control fire crew/unit arrived at the fire scene.

Item 10 - Notification. Enter the time of day that Range Control first notified each agency or individual listed and enter the time each agency or individual arrived at the fire scene.

Federal Fire Dept:	Must be notified of all fires.
Wildland Fire Mgr:	Must be notified of all fires.
Installation Ops Ctr:	Notified if helicopter support or additional fire assets are required.
Range Officer:	Notified of all major fires only.
Range Ops Supv:	Must be notified of all fires.
Natural Res Mgr:	Notified if fires are potential threat to T&E plant or animal species.
USFWS:	Must be notified of all fires that escape firebreak road or installation boundary.
Remarks:	Enter appropriate comments if any.

Item 11 - Enter daily Fire Danger Rating.

Item 12 - Enter current Burn Index (BI) at the time of the fire start.

Item 13 - Enter total estimated number of acres destroyed by fire.

Item 14 - Enter YES if fire area is greater than 10 acres. The training unit OIC must submit an After-Action-Report (AAR) if fire area exceeds 10 acres. OIC must complete the AAR before clearing the range.

Item 15 - Fire Escape Analysis.
15a. Check Yes or No if fires started outside firebreak road.
15b. Check Yes or No if fires escaped the firebreak road.

Item 16 - Helicopter Support. Enter type of aircraft used on fire.
16a. Enter fire bucket size used on fire.
16b. Enter aircraft call sign tail number. (i.e., Hillclimber 150)
16c. Enter time of day aircraft arrived on scene and time aircraft departed.

Item 17 - Fill in narrative form any information as to the cause of the fire, ignition sources, or item known to have started the fire. DO NOT speculate. Validate with training unit OIC. Conduct fire investigation as required.

Item 18 - Indicate ammunition type used that caused the fire.

Item 19 - Indicate weapon system used that caused the fire.

Item 20 - Enter name of training unit that caused the fire.

Item 21 - Enter name of the OIC responsible for the training unit.

Item 22 - Enter the telephone number of the OIC of the training unit where he may be contacted in the event additional information is required.

Item 23 - Indicate if an AAR is required. If yes, AAR must be completed by the unit OIC and submitted to Range control prior to release or range clearance.

Item 24 - Remarks. Enter appropriate comments pertaining to subject wildfire incident, if any.

Item 25 - Enter date and name of individual filling out the fire report.

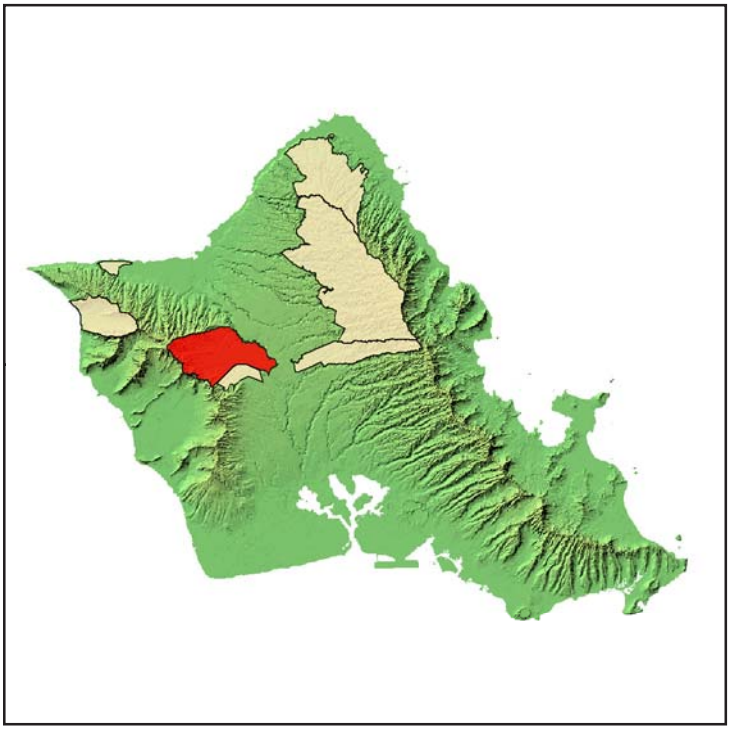
Item 26 - Enter date and name of the range supervisor reviewing the fire report. Range supervisor will review all fire incident reports for adequacy prior to submission to the wildland fire program manager.

FAX INSTRUCTIONS

A COPY OF ALL FIRE REPORTS WILL BE FAXED TO THE WILDLAND FIRE PROGRAM MANAGER WITHIN 24 HOURS AFTER THE FIRE INCIDENT IS REPORTED. ALL ORIGINAL WILDLAND FIRE INCIDENT REPORTS WILL BE MAINTAINED IN THE CURRENT FILE AREA OF EACH RESPECTIVE RANGE CONTROL OFFICE. A MAP MUST BE ATTACHED TO THE FIRE REPORT THAT IDENTIFIES AREAS BURNED.

SCHOFIELD BARRACKS MILITARY RESERVATION

STANDING OPERATING PROCEDURES



SCHOFIELD BARRACKS MILITARY RESERVATION WILDFIRE SOP

1. GENERAL

1.1. Purpose.

a. The purpose of this Standing Operating Procedure (SOP) is to provide specific requirements to delineate the responsibilities of Army, Federal Fire Department, Range Control personnel, and military training units in the prevention and suppression of wildland fires at Schofield Barracks Military Reservation (SBMR). Its primary objective is to prevent unplanned ignitions through sound preventive measures. It also establishes procedures for fire control and the protection of natural/cultural resources from wildfires.

1.2. Scope and Applicability.

a. The provisions outlined in this SOP are applicable to personnel assigned to SBMR, and all military training units utilizing SBMR. The installation commander and senior unit commanders, regardless of service or component, whose unit has been allocated the use of SBMR, will ensure compliance with this SOP.

b. All officers and noncommissioned officers will familiarize themselves with the contents of this SOP or receive a fire prevention briefing prior to use of the SBMR range facilities. It is imperative that awareness on the part of all commanders is maintained and that all persons are instructed in fire prevention and fire suppression.

c. It is the intent of this SOP that all persons are made so aware, and that the instructions and guidance contained herein is employed with a view towards accomplishing training with an absolute minimum of unwanted fires. Fire prevention is the responsibility of every soldier, contractor, or other persons working or training at SBMR.

d. See figure SBMR-1 for an overview.

1.3. Responsibilities.

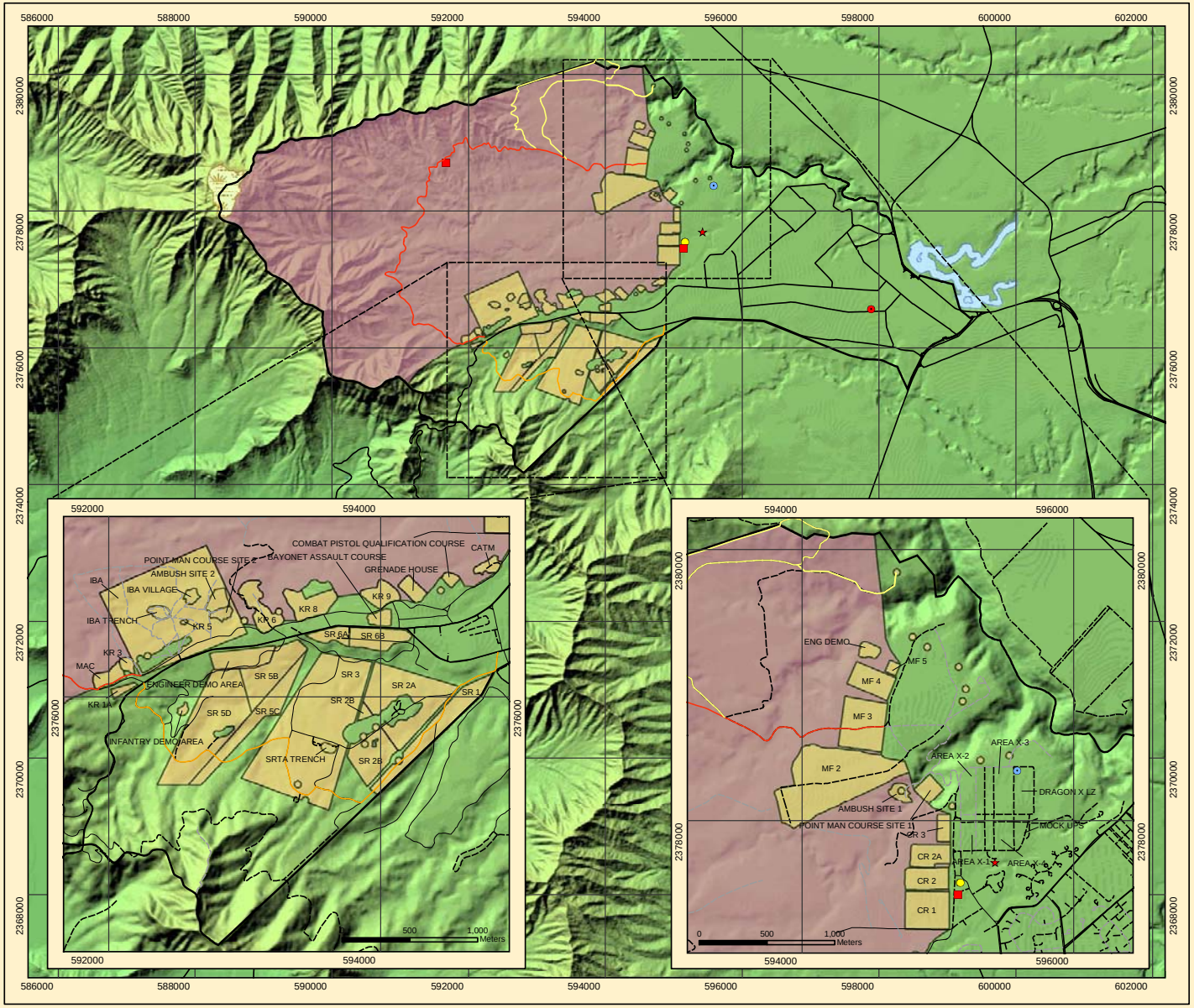
a. Installation Commander. The Installation Commander has the overall responsibility for fire prevention and protection requirements and environmental management at SBMR.

b. Director of Installation Fire and Safety Office. The Director of Installation Fire and Safety has overall responsibility for the wildland fire management program.

c. Fire Chief, Federal Fire Department (FFD). The installation Fire Chief is responsible for the organization, supervision, and management of all aspects of the fire prevention and protection program in accordance with the provisions of DoDI 6055.6, Fire Protection.

d. Range Officer, G3/DPTM, Range Division Hawaii. The Range Officer has overall responsibility for enforcing the provisions of the Integrated Wildland Fire Management Plan (IWFMP) and other applicable training directives and regulations, including restrictions on or cessation of training activities based on the day's fire danger rating.

(This Page Intentionally Left Blank)



Schofield Barracks Military Reservation
Fire Suppression
Resource Locations

Figure SBMR - 1

Legend

- Existing Firebreak
- Proposed MF Firebreak
- Proposed SR Firebreak
- Fire Cache
- Fire Station
- Hummer/Water Tender Station
- Remote Auto Weather Station
- Proposed Dip Pond
- Installation Boundary
- Ranges
- Dudded Impact Area
- Bog
- Surface Water Body

Roads

- Primary
- Secondary
- Tertiary
- Unimproved

N

1:60,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: USARHAW IFSO

e. Range Operations Supervisor, Schofield Barracks. The SB Range Operations Supervisor is responsible to the Installation Commander for ensuring proper fire prevention measures are taken by troops in rear areas; fires in forested and other training areas, when discovered, are promptly reported; and augment the Federal Fire Department in fighting any fires on SBMR.

f. Wildland Fire Program Manager, IFSO. The Wildland Fire Program Manager is responsible for the execution of the Army's wildland fire program. Collaborates with other resource managers, FFD and other cooperative fire agencies to ensure that supplies, equipment, training, and qualified personnel are available to meet the goals and objectives of the IWFMP.

g. Unit Commanders and Division Chiefs. Commanders, managers, and supervisors at all levels of the organization are responsible for ensuring unit personnel are familiar with and comply with the provisions of this SOP and applicable regulations, fire prevention restrictions, training activities within biologically sensitive areas, providing qualified personnel to support the wildland fire management program.

1.4. Environmental Considerations.

a. Wildland Fires. Wildfires pose significant risks to threatened and endangered species of plants and animals and their native habitat. These habitats are located throughout the training ranges and adjacent to the installation (see Figure SBMR-2). Cultural resources, including known archaeological sites, are also found within the installation. Significant threats to the archaeological sites at SBMR have generally been identified as explosive ordnance detonation, maneuvering activities, unmonitored ground disturbing activities, and vegetation clearance. Fire is also a potential threat to archaeological sites via fire suppression activities.

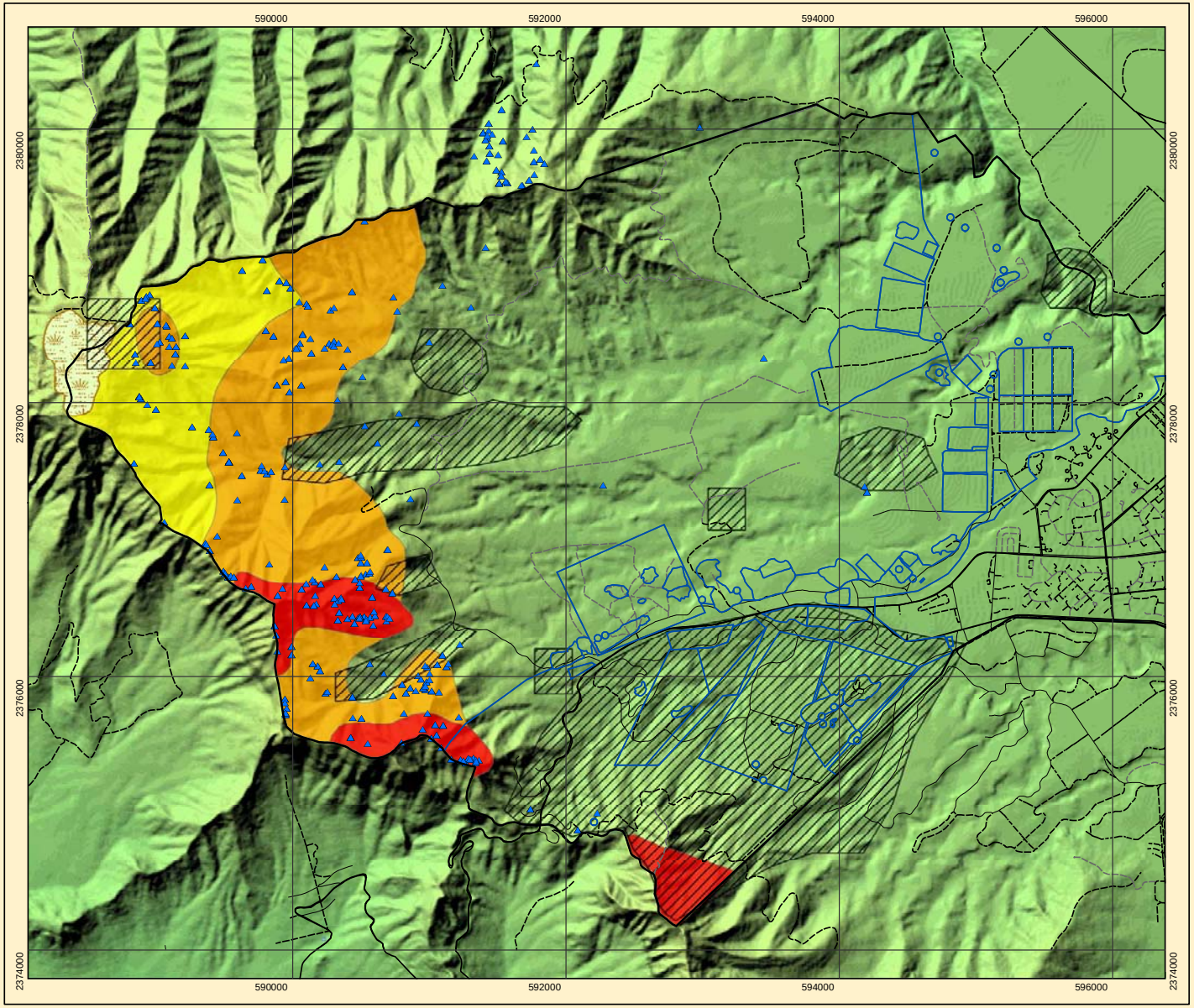
b. Applicable environmental laws mandate the protection and conservation of natural/cultural resources. The use of various ammunitions, weapon systems, pyrotechnics, vehicles and the presence of humans all increase the risk of wildfire which is one factor that can destroy native habitat. In the past, live-fire activities at Schofield Barracks have burned large areas of native vegetation and threatened endangered species of plants and animals. The continued use of Army training lands in Hawaii greatly depends upon the Army's ability to reduce the number of fire starts and control fires that do start within the installation boundary.

2. FIRE PREVENTION.

a. One of the primary objectives of this SOP is to integrate fire management actions commensurate with military training requirements and range operations. The prevention of fires is the responsibility of every individual training and/or working at SBMR.

b. Fire prevention and the ability to control the spread of fires is critical for the continued survival of endangered plants, animals, and native ecosystems, and the Army's continued use of the area as a live-fire range. Currently, there are many instance where military operations conflict with the management of these special natural resources. These conflicts often result in reduced training capability as "WILDLAND FIRES STOP TRAINING". Fire management actions are designed to reduce existing conflicts between necessary military training activities and the conservation of natural and cultural resources found within SBMR.

(This Page Intentionally Left Blank)



Schofield Barracks Military Reservation
Protected Resources

Figure SBMR - 2

Legend

Biological Sensitive Areas

- BSA-1
- BSA-2
- BSA-3
- Sensitive Archeological Areas
- Federally Listed Species
- Installation Boundary
- Ranges
- Surface Water Body
- Bog

Roads

- Primary
- Secondary
- Tertiary
- Unimproved

N

1:30,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: Biological Assessment for Endangered Species Act, Section 7 Consultation on Routine Military Training and Transformation of the Second Brigade to a Stryker Brigade Combat Team, 25th Infantry Division (Light), U.S. Army Hawaii. Various Sites, Island of Oahu. 21 March, 2003.

USAG HI DPW 2003.

2.1. Education.

a. Soldiers will be briefed prior to training about fire prevention, and cultural and natural resource protection. The fire prevention briefing ensures that important information is provided to using individuals that may start wildfires.

b. Signs will be posted throughout various areas as reminders of prevention and awareness of the Fire Danger Rating System (FDRS).

c. The Integrated Training Area Management (ITAM) and Directorate of Public Works (DPW), Environmental Conservation Office will provide training units with informational brochures to increase public and soldier awareness of the threat that wildfires pose to natural resource values.

2.2. Enforcement.

a. Enforcement of fire prevention and training policies is key to the success of an effective wildfire management program. Regulation amendments pertinent to fire may eventually become necessary to meet concerns generated by future increase in public and military use activities and/or changes in existing conditions.

b. Range Control safety staff has the primary responsibility for ensuring that all regulations and SOPs are adhered to. Range Control and fire department personnel have the authority to stop live-fire training for noncompliance with any training regulation and/or this SOP.

c. Secondary responsibility rests with the using unit commanders.

d. Failure to comply with regulations governing fire safety and prevention policies may result in termination of training activities, de-certification, and administrative disciplinary action in accordance with applicable regulations.

2.3. Engineering.

a. Two new firebreaks are scheduled for the ranges. One will be west of the MF's, the other will encompass South Range.

b. Firebreaks will be constructed to USARHAW standard width (see Section 4.3). The design and construction of the firebreaks will minimize negative effects to the extent feasible.

c. Engineering projects on training ranges shall be reviewed by the Wildland Fire Program Manager to ensure that fire prevention measures are considered during design, construction, or alignment of new ranges. Coordination with the G3/DPTM, Range Planner on engineering activities is essential to eliminate potential conflicts as related to fire prevention and fire safety.

d. An annual work plan identifying fire management projects by priority will be developed. This process will ensure that these projects (i.e., prescribed fire, maintenance of firebreak roads, herbicide, etc.) can be completed and will eliminate any conflicts between required maintenance of the ranges and military training activities.

2.4. Ignition Control.

a. While training at SBMR, units must use extra caution during live-fire training exercises. Soldiers must be aware of and adhere to fire danger-rating restrictions. Strict compliance with training restrictions set forth in the Range SOPs and herein will reduce the number of fire starts.

b. A Fire Danger Rating System (FDRS) has been developed for SBMR. The FDRS for SBMR is described in section 3.1 and Enclosure 7, of this SOP.

c. All training will be subject to the fire danger rating system (see Section 3.1 and Enclosure 8 of this SOP).

e. Fuels management as described in Section 7.8.5 of the IWFMP will be implemented in part to reduce the chance of ignition.

3. PRE-SUPPRESSION ACTIONS.

3.1. Fire Danger Rating System (FDRS).

a. Schofield Barracks Range Control will be responsible for retrieving weather data from the Schofield Remote Automated Weather Station (RAWS) located at Range CR-1 and archiving it into the WeatherPro software program. The Burn Index (BI), as determined by the National Fire Danger Rating System (NFDRS), will be used to rank fire danger to determine restrictions on pyrotechnic use, if any, in the impact area, maneuver training areas, and/or fixed ranges.

b. BI's will be monitored hourly by Range Control whenever live-fire training is scheduled. Range Control will notify the training unit of any training restrictions being imposed as a result of unfavorable fire danger ratings. Additionally, at any time that the BI changes from one category to another, the training unit will be notified immediately.

c. Hourly fire danger ratings will also be posted by Range Control. This data will be made available to training units and will be used as the basis for making decisions concerning limiting the use of selected weapons systems or ammunition on specific ranges.

d. While training at DMR, units must use caution during training exercises. Soldiers must be aware of and adhere to fire danger-rating restrictions of incendiary ammunition, pyrotechnics, smoking, and other ignition sources (see Enclosure 8). Strict compliance with training restrictions set forth herein will reduce the number of fire starts. The DMR Fire Danger Rating System is as follows:

Flame Length (ft)	*Burning Index*	*Fire Index Color*
0-6	0-16.9	Green
6-11	17-48.9	Yellow
11+	49+	Red

e. Range Control approval and guidance must be obtained prior to projected "HOT" range status. The OIC in charge of the training unit will allow firing or training to commence only after ascertaining the fire danger rating in effect and adopting the appropriate fire prevention measures.

3.2. Minimum Staffing Requirements.

a. Proper staffing and fire response of the FFD shall be in accordance with DODI 6055.6, Fire Protection Program.

b. An auxiliary wildland fire fighting force (Range Control) augments the FFD as first responders during initial attack operations on training ranges. At a minimum, wildland fire operations require two (2) trained Range Control personnel for each HMMWV response. Range Control will serve as first responders since they can arrive at the scene more quickly than the FFD.

c. The Range Operations Supervisor will arrange work schedules to allow flexibility while ensuring that minimum staffing levels are met at all times, to include overtime authorizations. In the event of a fire, fire fighting duties take precedence over other work assignments.

3.3. Training

a. Policy requires that all Range Control and fire department personnel engaged in suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG). The Army's Wildland Fire Program Manager will coordinate with the FFD and Range Control staff to develop a certification-training program.

b. Individuals will not be assigned to duties for which they lack training and/or certified experience. All Range Control and fire department personnel dispatched or assigned to wildfires or prescribed fires will be qualified for the fire position assigned, unless assigned as trainees and under direct supervision of higher qualified personnel at all times.

c. The Wildland Fire Program Manager will administer and manage an effective qualification and certification program. He/She will monitor all employee's wildland fire management development (training and experience) to ensure accurate qualification and certification standards. All personnel engaged in wildland ground fire fighting activities must satisfactorily complete the following suppression skills courses as a minimum: S-110, Basic Fire Suppression Orientation; S-130, Firefighter Training; S-190, Introduction to Fire Behavior; and I-100, Introduction to Incident Command System (ICS).

d. The Army's Wildland Fire Program Manager will coordinate with the FFD training officer to develop the annual wildland training schedule. A recurring proficiency program will include quality instruction and evaluation of employee's proficiency level through quarterly training exercises that are monitored by the fire department training officer.

3.4. Fire Equipment and Supplies.

a. If at any time the required fire suppression equipment is not operational, live-fire training will be suspended until all required equipment is operational. Live-fire training will only be conducted when fully trained/certified personnel and properly functioning equipment is available for fire suppression. This requirement pertains to all types of fire fighting equipment, water resources, and personnel.

b. The Wildland Fire Program Manager will maintain a cache of fire equipment in a constant state of readiness located at Building 1029, Area X, SBMR. The fire cache will contain a supply of fire hand tools, chainsaws, pumps, forestry hose, foam concentrate, etc., necessary to support fire suppression activities.

c. The Wildland Fire Program Manager will conduct periodic checks to ensure all resources are in place and will identify and immediately correct any deficiencies. Range Control shall coordinate with the Army's Wildland Fire Program Manager for equipment replacement.

d. Range control shall be responsible to coordinate with the Wildland Fire Program Manager for replacement of equipment.

3.5. Personal Protective Equipment (PPE).

a. It is mandatory that all fire fighting personnel assigned to SBMR be equipped with proper PPE (see Reference 4.2.2 of the IWFMP) necessary for combating wildfires. Range Control personnel will ensure that proper PPE is worn at all times when actively engaged in fire fighting duties. Personal safety and prevention of injuries is the first priority in every fire management activity.

b. To ensure operational readiness during live-fire training exercises, range operations personnel assigned for fire fighting duties will be required to wear Nomex pants and wildland boots as part of their daily attire. This action will prevent delays and enhance response times to wildfire incidents at SBMR.

c. PPE for training units during major wildfire incidents will be issued from the SBMR fire cache supplies. The fire cache will be maintained by the Wildland Fire Program Manager and shall be equipped to outfit a minimum of one-hundred (100) firefighters with appropriate PPE.

3.6. Fire Vehicles.

a. One HMMWV from Range Control equipped with 300-gallon slip-on pump unit (Class A foam capable) shall be assigned for initial attack response at SBMR.

b. Range control personnel operating fire response vehicles shall be qualified and licensed to operate emergency vehicles. The Wildland Fire Program Manager shall monitor vehicle qualification and training program for Range Control staff.

c. FFD response will be in accordance with FFD SOP's for wildland fire response, usually a brush company and water tender (1000-gallon capacity).

d. Range control personnel will perform daily preventive maintenance inspection of fire vehicles and pumps to ensure operational readiness. All discrepancies shall be identified and annotated on DA Form 2404, Vehicle Discrepancy Inspection Checklist. The SB Range Operations Supervisor will review all 2404's and coordinate required repair with the Wildland Fire Program Manager. A Priority 03 and Force Activity Designator (FAD) III for replacement parts to support emergency fire equipment shall be assigned in accordance with AR 420-90, Facilities Engineering, Fire Protection, Chapter 4-7.

e. Maintenance and/or repair of assigned fire vehicles shall be performed by local contract vendors. Funding to support all maintenance and repair is included in the annual Wildfire Management Program budget.

f. Water for fire fighting is available in the dip pond in Area X (to be constructed in FY 04) and at fire hydrants throughout the installation.

3.7. Helicopter Fire Bucket Support.

a. In the event of a major wildfire, Range Control or FFD will initiate a request for helicopter fire bucket support through the Installation Operations Center (IOC). See Enclosure 7.

b. Helicopter aviation support units will provide the Range Division Hawaii (RDH) with a list of all pilots and aircrew members that are certified in fire bucket operations and fire suppression application techniques for wildland fires. This list will be submitted to the Army's Wildland Fire Program Manager and will be updated quarterly or as required.

c. Military helicopter units must provide their own fire buckets. The RDH currently maintains three BAMBI fire buckets [(2) 660-gallon and (1) 2000-gallon] for emergency backup use by military UH-60, CH-53, or CH-47 aircraft assigned to conduct fire bucket operations.

d. The RDH staff is responsible to ensure that a serviceable primary and reserve BAMBI fire bucket is available for use by trained helicopter aircrews at all times. All discrepancies and the status of inoperable fire buckets will immediately be reported to range maintenance or the Wildland Fire Program Manager to coordinate immediate replacement or repair.

e. Air-to-ground radio communication must be established with the IC and helicopter support units involved in fire suppression activities. The capability for the IC to coordinate and direct air support with ground fire fighting crews is essential for safe and effective application. Refer to the Army's Communication Plan and Aviation Plan for assigned radio frequencies on Oahu.

f. The primary water source for air operations will be the SBMR dip pond which is to be constructed in FY 04. In the interim, helicopter fire bucket aircrews must transit to an approved water resource site for water. The US Army has negotiated a 5-year lease agreement with private landowners on the use of water reservoirs in the Central Oahu area for use during training and major wildfires on Army training lands.

3.8. Other Resources.

a. The Army has entered into Cooperative and Mutual Aid Agreements for fire fighting assistance during major wildfire incidents with various federal, state, and local fire agencies. See Appendix 2, Interagency Cooperative Agreements, of the IWFMP.

b. All lease agreements shall be reviewed annually and updated every five years or as required.

4. FIRE SUPPRESSION ACTIONS.

4.1. Fire Reporting and Notification Procedures.

a. Early fire detection and prompt reporting is critical to effective initial attack. All fires, regardless of size, will be reported immediately by the OIC to Range Control and in turn, to the FFD.

b. In the event of a wildland fire on any range, impact area, or maneuver area, the unit OIC will immediately notify Range Control by the most expeditious means possible (radio or telephone), stating the exact location (grid coordinates) and the extent of the fire. The OIC will immediately initiate a “cease fire” order and remain in the area with the unit subject to the orders of Range Control and/or FFD when they arrive on the scene. Refer to Enclosure 3, Schofield Barracks, Operational Decision Chart, Initial Attack Plan.

c. Units will not be allowed to resume training until the fire is extinguished or upon approval by the Range Operations Supervisor and/or SFO of the FFD.

d. Failure to report any fire will result in termination of scheduled training and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

e. Upon notification of a fire, Range Control will immediately notify the FFD by telephone (471-7117) and provide the exact location (grid coordinates), building or range number, maneuver area, or make a reference to a prominent terrain feature (e.g. MF-5, SR-3, MOUT, etc).

4.2. Initial Attack.

a. Immediate and aggressive response to all fires is an unconditional recommendation for SBMR. Within the confines of due care for personnel safety, the high resource values of the area justify the fullest commitment to expeditious containment and control of all fires. The difficult and often hazardous fire conditions warrant total initial effort to arrest fires in the early stages. Fiscal consideration must be secondary in ensuring timely and adequate availability of necessary fire fighting resources. In reality, the savings to be realized from a successful initial attack will offset the cost of many so called “over reactions”.

b. Upon notification of a fire by the training unit, Range Control will close the range or potential affected ranges to ensure proper clearance for fire suppression resources responding down range.

c. Trained Range Control fire crews will immediately proceed to the scene of the fire and assume command and control of all fire fighting activities. Range Control will direct fire suppression actions until properly relieved by the first arriving FFD unit. At this time, the fire will be evaluated as “Routine”, “Serious”, or “Critical”, defined as follows:

(1) Wildland Fires (ROUTINE). Wildland fires that can be handled by Range Control.

(2) Wildland Fires (SERIOUS). Wildland fires that may require the assistance of helicopters and/or military personnel under direct supervision of the FFD.

(3) Wildland Fires (CRITICAL). Wildland fires that will require the assistance of mutual aid and pose a critical threat to loss of high value resources and/or potentially may leave the SBMR installation boundary.

1. Types of Attack.

(a) Direct Initial Attack (IA). Direct initial attack by the training unit or trained Range Control staff at the onset can suppress fires at the point of origin while still small and prevent fires from spreading. However, fuel loads, UXO, and terrain conditions at SBMR currently limit safe and effective direct attack by fire crews in some of the area. Ground fire fighting crews can be effective for containing, or at least retarding the spread of fires until water/retardant drops from helicopters are on line. Direct attack with helicopter water drops can be very effective. Aerial fire bucket operations will be utilized to control fire in remote areas that are inaccessible by ground fire fighting teams.

(b) Indirect Attack. Indirect attack is the use of ground crews or aircraft to create control lines in front of fires before the fire arrives. In areas with heavier fuel loads or when the fire is exhibiting intense behavior, indirect attack incorporating offset hand lines roads and pre-constructed firebreaks can be used as an approach. Unless conditions of the particular incident determine otherwise, fuel within compartments isolated by barriers or control lines should be expeditiously back fired (burned out to cause fuel starvation) to reduce chances of fire escape.

2. Recommendation for suppression outside the firebreaks. The direct attack method is considered the best method outside the firebreaks. Hand crews, brush engines and aerial buckets can be used in this area. Since it is desired to suppress a fire as quickly as possible using crews with hand tools and engines/buckets with water/foam directly on a fireline is recommended. Black lines/backfiring can also be established as a control measure for fuel starvation, but should be used as a last resort due to high resource values in most of the area outside the firebreaks. Due to the rough terrain in portions of the installation and the presence of cultural sites, bulldozer lines are considered a last resort and should be only sited (unless used to clear old paths) with the recommendation of the DPW Environmental Division. Caution should be exercised in determining escape routes and safety zone prior to employing crews in these areas as there are few breaks in the fuels.

3. Recommendation for suppression inside the firebreaks. Both the direct attack and indirect attack method can be used inside the firebreaks. Use of aerial buckets with water/foam directly on a fireline or indirectly to establish foam or retardant lines in front of, or around a fire, is recommended. Black lines/backfiring should only be used as a last resort and only with a control line. Due to the UXO tractor lines are not normally practical. During an extended attack, DPW Environmental Division personnel can assist with establishing protection priorities.

d. In the event fire escapes initial attack, the IC will implement an extended attack plan or fire escape contingency plan. (Refer to Extended Attack Plan, Enclosure 4; Escape Fire Situation, Enclosure 5; and, Monitoring Procedures Enclosure 6, of this SOP).

4.3. Command and Control.

a. The FFD will establish command and organize ground operations under the Incident Command System (ICS) and Unified Command during multi-agency response.

b. As the Incident Commander (IC), the District Fire Chief or the Senior Fire Officer (SFO) will establish a command post when it is anticipated or the fire incident is actually of serious or critical nature.

c. Once resources have been committed to fire fighting, they are under the control of the IC. The IC directs the overall employment of auxiliary fire fighting resources to contain and extinguish the fire. This does not preclude unit commanders from rotating personnel and equipment necessary for rehab.

d. The IC will coordinate with the Range Control and/or training units when requesting military assistance for combating major fires. The primary mission of the unit commanders in the geographical area will shift from training objectives to fire control.

e. The use of military personnel will only be authorized under the most extreme circumstances. When utilized, military personnel will be under the control of a qualified fire department officer.

f. The IC will initiate action requesting mutual aid support from other fire agencies in accordance with established Cooperative Agreements when required.

g. Fires in the impact area with potential for escape and/or fires started outside the SBMR boundary that have potential to carry into high resource value areas on SBMR justify the fullest commitment to aggressive containment and control of fires. The Army shall work with adjacent landowners to control fires before they enter or escape the SBMR boundary.

5. POST-FIRE ACTIONS.

5.1. Records and Fire Reports.

a. It is important that all fire incidents are documented to ensure an accurate fire history is maintained. Fire reports are used to track location, size, cause, and frequency for future input and use in fire trend analysis and Geographical Information Systems (GIS).

b. Range Control will maintain a log of all fires on DA Form 1594, Daily Staff Journal or Duty Officer's Log. All fire incidents will also be assigned a fire number and officially recorded on the standard Wildland Fire Incident Report form for all Army training lands. A sample Wildland Fire Incident Report form is included in this SOP (see Enclosure. 9).

c. The Range Operations Supervisor will review all fire reports for accuracy and proper completion of the Wildland Fire Incident Report. A copy of each report will be faxed to the Wildland Fire Program Manager at the earliest opportunity. DPW Environmental will forward copies of all Fire Incident Reports on fires that escape the firebreak road at SBMR to the U.S. Fish & Wildlife Service (USFWS).

d. Fire records will be kept on an automated computer database and maintained by the Wildland Fire Program Manager for accurate fire history and fire trend analysis. The Wildland Fire Program Manager and DPW Natural Resource Manager will coordinate submission of semi-annual fire incident reports to USFWS NLT 10 July and 10 January of each calendar year.

5.2. Surveys

a. In addition to the reports and reviews that are completed immediately after a wildfire, a post-fire analysis survey of the burned area may be required depending on the fire's location and vegetation damaged. The post-fire analysis may be combined with any of the informal or formal investigations. A post-fire analysis will need to determine either all or part of the following:

(1) The effect the fire may have had on native or alien flora and fauna resources and cultural resources.

(2) The effectiveness of the pre-suppression measures including fuel modifications.

(3) The effectiveness of the suppression resources and measures used.

(4) The effectiveness of the ICS.

(5) The effectiveness of fire/fuel models used.

(6) A safety review of suppression actions.

(7) A UXO contamination survey or potential UXO clean up operation.

b. A post-fire survey of the fire area will be conducted with the coordination of the DPW Environmental and ITAM office.

c. The effects of fire on threatened and endangered species or effects from catastrophic events must be surveyed at the earliest opportunity.

d. If during the survey, it becomes evident that a wildfire has occurred outside the perimeter of the firebreak and/or affected BSA/SEA, or threatened any endangered species, the USFWS and the State of Hawaii, Division of Forestry & Wildlife (DOFAW) will be notified. If military training activities were determined to have caused the wildfire, the Army will reinitiate Section 7 consultation under the Endangered Species Act (ESA).

e. If a UXO survey or clearing operation is desired, coordination with the Explosive Ordnance Disposal (EOD) unit is necessary. Surveys or clearing operations must be planned, coordinated, and should be carried out immediately after a fire.

5.3. Investigations and Accident Reporting.

a. After Action Reports (AAR) will be conducted for fires of four hectares (ten acres) or more and/or during which unusual events occurred, including failure to follow instructions.

b. The RDH will request a formal investigation for fires involving any of the following:

(1) Training related caused fires escaping or starting outside SBMR boundary.

(2) Damage or loss of valuable property exceeding $1000.00.

(3) Damage of loss to Biological Sensitive Area (BSA) or incidental take of plant or animal specie.

(4) All entrapments of fire shelter deployments.

(5) Major injury or fire fatality.

ENCLOSURE 1 FIRE PREVENTION BRIEFING

The following verbiage will be included in a general safety, environmental and fire prevention briefing to be given to all personnel before training at SBMR.

The purpose of this brief is to educate users of the range about the dangers of fire on the range. Fire prevention is the responsibility of every person working or training on the range. There are several reasons that fire prevention is so important. Fire poses a grave threat to endangered plants and animals at SBMR. Fires also pose a danger of damage to archaeological sites. If a fire starts, all training must cease, and training downtime will result. For these reasons, every effort must be made to prevent range fires. In order to prevent fires, you must follow the following rules:

1. No lighted tobacco smoking materials will be discarded on the range. Smoking on the ranges is prohibited with the exception of on roads and other barren areas.

2. Open fires are not authorized.

3. Heat tabs and similar commercial products must be used inside metal containers.

4. The use of smoke grenades or simulators is authorized, but must be used in such a manner that will not cause fires to ignite. This means do not place smoke grenades or simulators in vegetated areas. Place them in the dirt or in metal cans provided by Range Control. Units are required to use metal barrels provided by Range Control in which to place grenades.

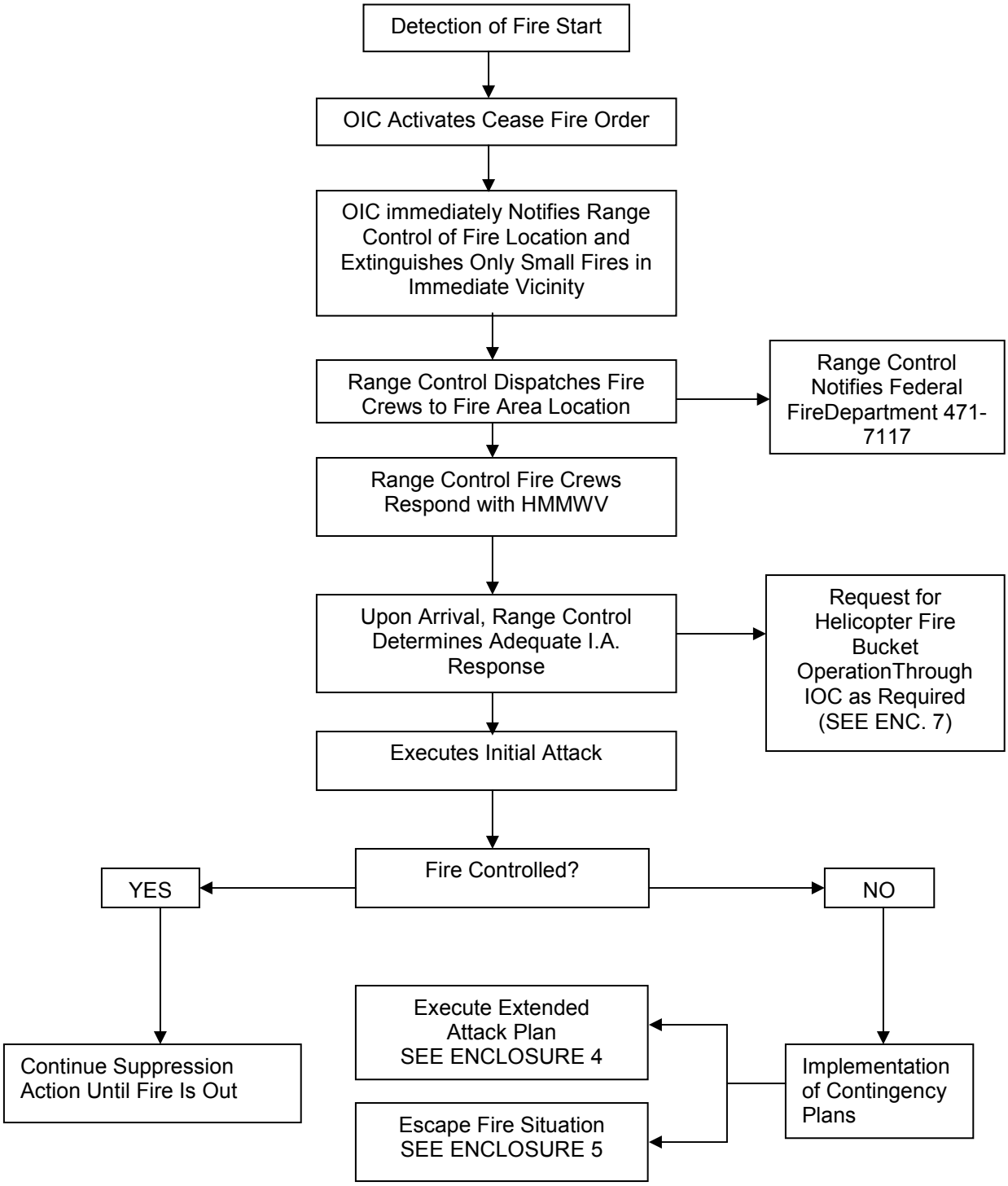
In the event a fire is started, cease training in the vicinity of the fire immediately. All fires, regardless of size, must be reported immediately to Range Control by radio or telephone. Every safe effort must be made to put the fire out, and to do so as quickly as possible. Every resource available on the Range must be committed to this effort. These resources include HUMMER Brush Engine fire trucks, and those of you that have been designated as part of the fire fighting team. Your unit leaders will advise you if you are on this team. In the event this fire fighting team is required, a trained safety technician will direct your work to put the fire out. The fire fighting team must be knowledgeable of safety and the proper use of backpacks and hand tools for fire fighting. When needed, this fire equipment will be issued at the designated site (Designate a site that everyone is familiar with). (Demonstrate the use of water backpack and fire swatter). Water for fire fighting is available in the dip pond in Area X and at fire hydrants throughout the installation.

ENCLOSURE 2 NOTIFICATION LIST

AGENCY NAME	PHONE NO.
FEDERAL FIRE DEPARTMENT (Emergency)	471-7117
Communications Center & Dispatch	474-2222
Honolulu Fire Department (Emergency)	911
25th ID(L) & USARHAW	
Installation Operations Center (IOC)	655-8763/8764
	655-2962 (Fax)
G3/DPTM, Range Division Hawaii	
Range Officer	655-1404
Range Operations Manager, SB	655-5243/9509
Schofield Range Control (24-hrs)	655-2292
ITAM Coordinator	655-0582/8463
Installation Fire & Safety Office	
Director	655-3350
Fire Chief	655-1331
Wildland Fire Program Manager	656-0615
	286-5818 (Cell)
DPW, Environmental Office	
Chief, Environmental	656-2878, x-1062
Natural Resource Manager	656-2878, x-1050
Cultural Resource Manager	656-2878, x-1052
Oahu Biologist	656-7641/7741
U.S. FISH & WILDLIFE SERVICE	
Field Supervisor	541-3441
Fax	541-3470
STATE OF HAWAII, DEPARTMENT OF LAND & NATURAL RESOURCES	
Division of Forestry & Wildlife	
Oahu Branch Manager	973-9787/571-9999
State Fire Protection Forester	587-4173/571-0000

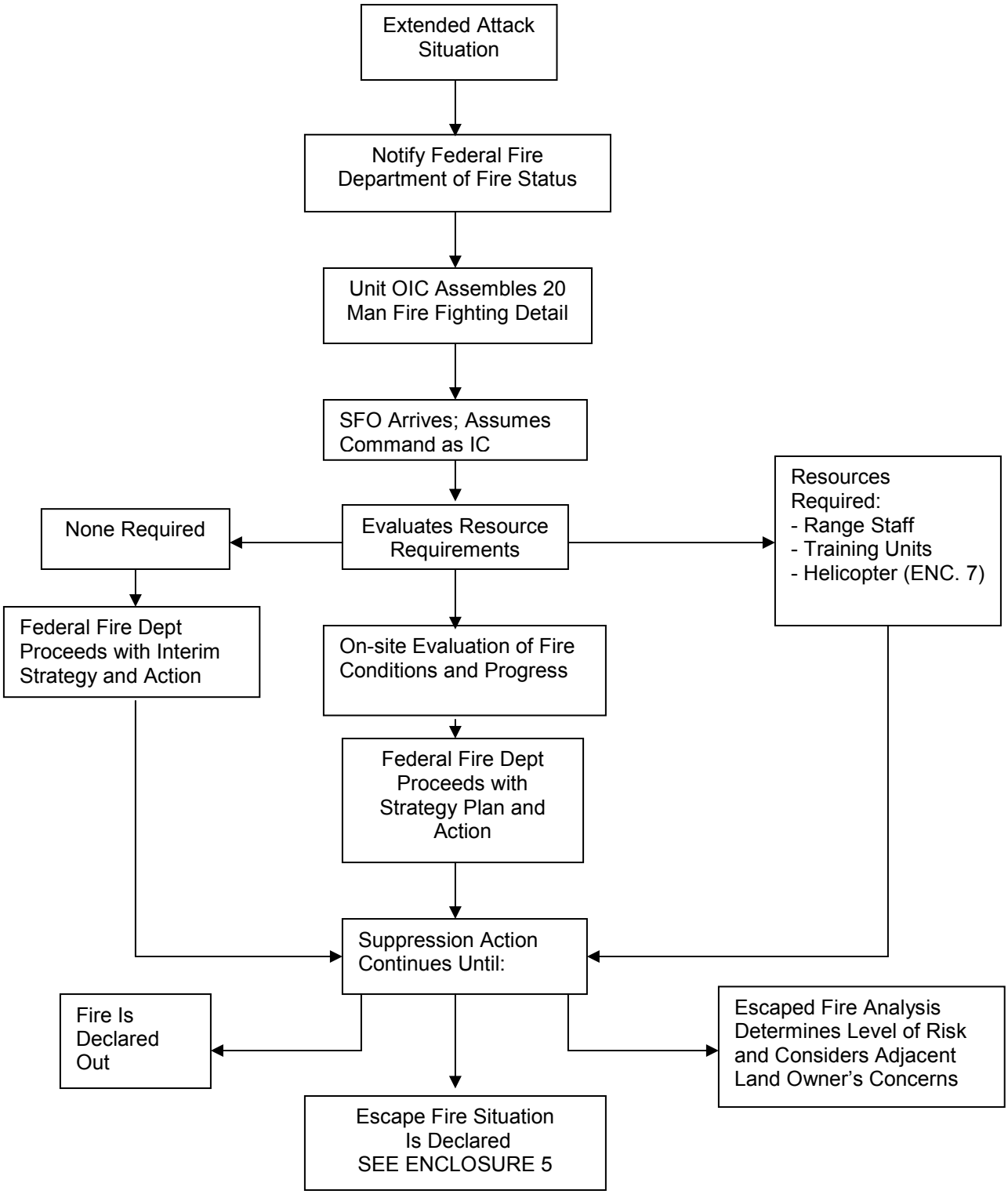
ENCLOSURE 3

SCHOFIELD BARRACKS MILITARY RESERVATION (SBMR)
OPERATIONAL DECISION CHART
INITIAL ATTACK PLAN



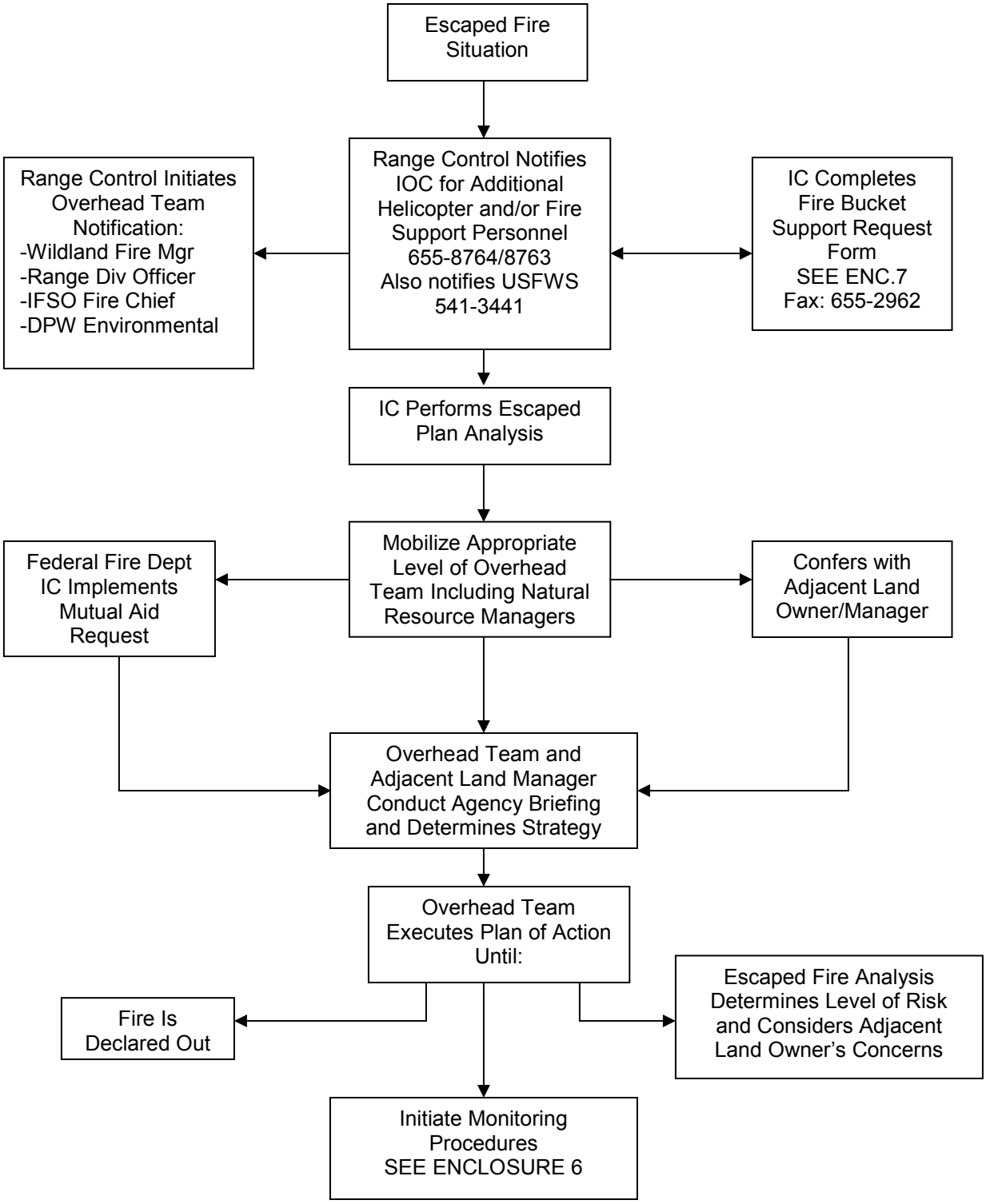
ENCLOSURE 4

SCHOFIELD BARRACKS MILITARY RESERVATION (SBMR)
OPERATIONAL DECISION CHART A,
EXTENDED ATTACK PLAN



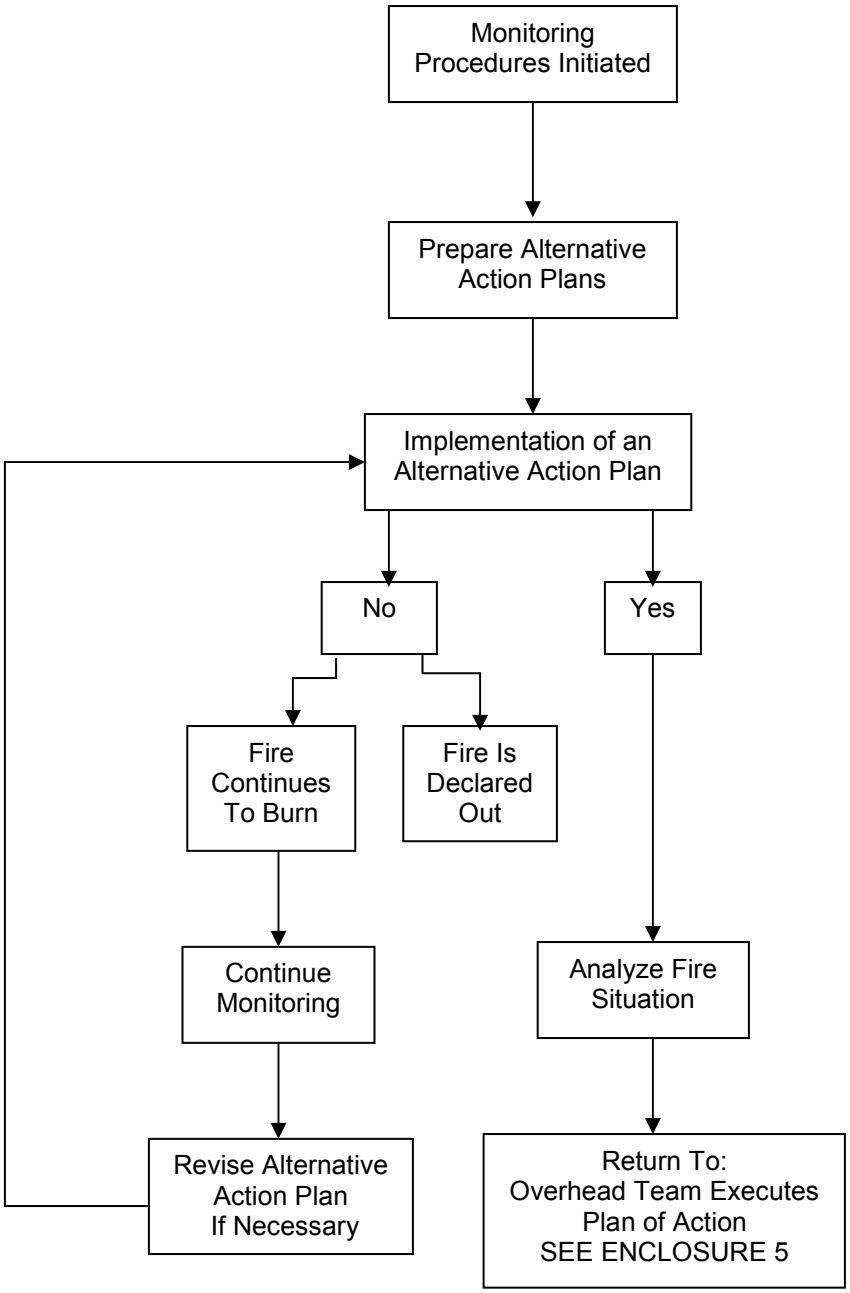
ENCLOSURE 5

SCHOFIELD BARRACKS MILITARY RESERVATION (SBMR)
OPERATIONAL DECISION CHART B
ESCAPE FIRE SITUATION



ENCLOSURE 6

SCHOFIELD BARRACKS MILITARY RESERVATION (SBMR)
OPERATIONAL DECISION CHART C
MONITORING PROCEDURES
(FIRES OUT OF CONTROL BEYOND SBMR BOUNDARY)



ENCLOSURE 7

25th ID(L) & USARHAW Reg 350-1

Request for Rotary Wing Aircraft Support

Date of Request:

REQUEST FOR ROTARY-WINGED AVIATION SUPPORT Proponent of this Form is G3, 25 ID(L) May 97		1. Late Request? Yes / No If Yes, Letter Incl? Yes / No
2. Requesting Unit:	3. POC and Ph# or Freq and Call Sign:	4. Submitted or Coord at AMAC/G3 Conf ?____ If Yes, Date:
5. Date(s) Required: 5a. Unit's Cycle:	6. Number and Type of Aircraft Requested: 1x UH 60	7. MSC or SEP BN S3 AIR:
8. Pick-Up Point(s)/PZ(s):	9. Destination(s)/LZ(s):	
10. Contact at PZ:	11. Contact at LZ:	
12. Pick-Up Time:	13. Release Time:	
14. Passengers:		
15. Cargo: (type, number, weight)		
16. Special Instructions or Mission Equipment: (e.g. Headphones, Cargo Hook, C2 A/C etc.)		
17. Mission Description: (who, what, when, where, why)		
18. Initial Planning Coordination: (when and where)		
AVIATION USE ONLY		
19. Mission Received From: (name, unit, date, time)		20. Mission Number
21. Mission Passed To: (name, unit, date, time)		
22. Mission Passed To: (name, unit, date, time)		
23. Mission Passed To: (name, unit, date, time)		
24. Number of Aircraft Assigned to Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
25. Estimated Number of Hours for Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
26. Remarks:		

ENCLOSURE 8

FIRE DANGER RATING SYSTEM (FDRS) FOR SBMR

FIRE DANGER RATING	BURN INDEX	FLAME LENGTH (FT)	CAUTION TO BE EXERCISED	RESTRICTIONS	HAZARD
GREEN	0-16.9	0-6	Use Normal Caution	None	LOW
YELLOW	17-48.9	6-11	Use Caution. Fires will start easily	No Tracers, No White Phosphorous, No Illumination Rounds.	MODERATE
RED	49+	11+	Use Extreme Caution. Fires are difficult to control	Blanks and Ball ammunition on CR and MF Ranges only. No other Live-Fire. No Pyrotechnics, smoking, warming/cooking fires. Maneuver Training is allowed.	HIGH

Burning Index Warning Table Schofield Barracks

1 HOUR FUEL MOISTURE

WINDSPEED	4	5	6	7	8	9	10	11	12	13	14	15	17	19	21	23	25
0	27	26	24	23	22	21	20	19	17	16	15	12	7	6	4	2	0
1	33	31	29	28	27	25	24	22	21	19	18	15	9	7	5	3	0
2	40	38	36	34	32	30	29	27	25	23	21	18	11	9	6	3	0
3	46	44	41	39	37	35	33	32	30	27	25	21	13	10	7	4	0
4	52	50	47	45	42	40	38	36	34	31	28	24	14	11	8	4	0
5	58	55	52	50	47	45	42	40	37	34	31	27	16	13	9	5	0
6	64	60	57	54	52	49	46	44	41	38	34	29	17	14	10	5	0
7	69	65	62	59	56	53	50	47	44	41	37	32	19	15	11	6	0
8	74	70	67	63	60	57	54	51	47	44	40	34	20	16	11	6	0
9	79	75	71	67	64	61	57	54	51	47	42	36	21	17	12	6	0
10	84	79	75	71	68	64	61	57	54	50	45	38	23	18	13	6	0
11	88	84	79	75	71	68	64	60	56	52	47	41	24	19	14	6	0
12	93	88	83	79	75	71	67	63	59	55	50	43	25	20	15	6	0
14	101	96	91	86	82	77	73	69	65	60	54	46	27	22	16	6	0
16	109	103	98	93	88	84	79	75	70	65	58	50	30	24	17	6	0
18	117	111	105	99	94	89	85	80	75	69	62	54	32	25	17	6	0
20	124	118	111	106	100	95	90	85	79	73	66	57	34	27	17	6	0

Fuel Model N
10 Hr fuel Moisture = 1 Hr fuel moisture + 1
Live woody fuel moisture = 100 percent
Slope class = 1
State of weather = 0
Temperature = 80 deg F

ENCLOSURE 9 WILDLAND FIRE INCIDENT REPORT

WILDLAND FIRE INCIDENT REPORT

25TH ID(L) & USARHAW

1. INSTALLATION	2. INCIDENT NUMBER (YY-000)

3. DATE (YYMMDD)	4. FIRE LOCATION (Grid Coordinates 6 digits only)	5. RANGE OCCUPIED BY UNIT
	EJ	

6. TIME FIRE REPORTED	7. TIME FIRE OUT	8. TIME RANGE OPS RESPONDED	9. TIME FIRST SFO AT SCENE

10. AGENCY NOTIFICATION (*If applicable*)	PHONE	TIME CALLED	AT SCENE	REMARKS
❑ FEDERAL FIRE DEPARTMENT	471-7117			
❑ G3/RDH WILDLAND PROGRAM MGR	286-5818			
❑ INSTALLATION OPS CENTER (IOC)	655-8763			
❑ RANGE OFFICER	655-1404			
❑ RANGE OPERATIONS SUPERVISOR	655-9509			
❑ DPW NATURAL RESOURCE MGR	656-2878			
❑ U.S. FISH & WILDLIFE SERVICE	541-3441			
❑ (Other)				
❑ (Other)				

11. FIRE DANGER RATING	BURN INDEX (BI)	15. FIRE ESCAPE ANALYSIS	CHECK ONE	
			YES	NO
❑ GREEN ❑ YELLOW ❑ RED	13. EST. ACRES BURNED?	15a. FIRE STARTED OUTSIDE FIREBREAK ROAD?		
	14. > 10 ACRES? (AAR)	15b. FIRE ESCAPED FIREBREAK ROAD?		

16. HELICOPTER SUPPORT	16b. Aircraft Call Sign	Tail No.	16c. Arrived On Scene	Departed
☐ UH-60 ☐ CH-53 ☐ CH-46 ☐ CH-47 ☐ OTHER				
16a. BUCKET SIZE (*BAMBI*) ☐ 240-Gal ☐ 660-Gal ☐ 2000-Gal ☐ Other				

17. FIRE CAUSE (*Narrative*)	18. AMMUNITION TYPE	19. WEAPON SYSTEM
	❑ Tracer ❑ Mortar ❑ Artillery ❑ HE / WP ❑ Pyrotechnics ❑ Grenade ❑ Demo / Mines ❑ Other	❑ AT-4 ❑ TOW ❑ SAW / M-16 ❑ SMAW ❑ LAW ❑ Rocket / Missile ❑ M240/M60 ❑ Other

20. TRAINING UNIT	21. UNIT OIC	22. TELEPHONE	23. AAR REQUIRED?

24. REMARKS
(Narrative)

25. FIRE REPORT COMPLETED BY:	DATE	26. FIRE REPORT REVIEWED BY:	DATE

WILDLAND FIRE INCIDENT REPORT FORM
GENERAL INSTRUCTIONS

PURPOSE AND USE: Used in the administration of the Wildland Fire Management Program. The purpose of this form is to document all wildfire incident(s) on Army training lands under the jurisdiction of the 25th ID(L) and USARHAW within the state of Hawaii. This form will also be used to document when Army assets respond to any wildland fire incident outside of its jurisdiction in support of mutual aid requests. Documentation of all wildfires is necessary to ensure accurate fire history and trend analysis to assist fire managers in future fire management planning. The form becomes part of the permanent record file for each Fire Management Area (FMA). Fire records may be kept on an automated computer database as part of long term land management records. n

DISPOSITION OF FILES: The maintenance and disposition of all wildland fire incident reports shall be in accordance with Army record management policy. Disposition: a) OCE: Destroy after 25 years in CFA. b) Other Offices: Destroy after 5 years.

PROPONENCY: The proponent of this form is the Installation Fire & Safety Office (IFSO). Action Officer is the Wildland Fire Program Manager.

COMPLETION INSTRUCTIONS

Item 1 - Enter appropriate name of military installation where the fire occurred.

Item 2 - Fill in incident number. Enter 2 digit calendar year followed by 3 digits in numbered in sequence for the number of fires occurred during that calendar year.

Item 3 - Enter date of incident. Year, month, day (YYMMDD).

Item 4 - Fire location. Enter 6-digit grid coordinates that indicate where the fire started. Provide 6-digits only in blocks provided. *(Right, then Up)*

Item 5 - Enter range, firing point, or maneuver area the training unit causing the fire occupied at the time the fire started.

Item 6 - Enter the time of day the fire was first reported to Range control.

Item 7 - Enter the time of day the fire was reported extinguished.

Item 8 - Enter the time of day the first Range control fire crew/unit responded to the fire location.

Item 9 - Enter the time of day the first Range control fire crew/unit arrived at the fire scene.

Item 10 - Notification. Enter the time of day that Range Control first notified each agency or individual listed and enter the time each agency or individual arrived at the fire scene.

Federal Fire Dept:	Must be notified of all fires.
Wildland Fire Mgr:	Must be notified of all fires.
Installation Ops Ctr:	Notified if helicopter support or additional fire assets are required.
Range Officer:	Notified of all major fires only.
Range Ops Supv:	Must be notified of all fires.
Natural Res Mgr:	Notified if fires are potential threat to T&E plant or animal species.
USFWS:	Must be notified of all fires that escape firebreak road or installation boundary.
Remarks:	Enter appropriate comments if any.

Item 11 - Enter daily Fire Danger Rating.

Item 12 - Enter current Burn Index (BI) at the time of the fire start.

Item 13 - Enter total estimated number of acres destroyed by fire.

Item 14 - Enter YES if fire area is greater than 10 acres. The training unit OIC must submit an After-Action-Report (AAR) if fire area exceeds 10 acres. OIC must complete the AAR before clearing the range.

Item 15 - Fire Escape Analysis.
15a. Check Yes or No if fires started outside firebreak road.
15b. Check Yes or No if fires escaped the firebreak road.

Item 16 - Helicopter Support. Enter type of aircraft used on fire.
16a. Enter fire bucket size used on fire.
16b. Enter aircraft call sign tail number. (i.e., Hillclimber 150)
16c. Enter time of day aircraft arrived on scene and time aircraft departed.

Item 17 - Fill in narrative form any information as to the cause of the fire, ignition sources, or item known to have started the fire. DO NOT speculate. Validate with training unit OIC. Conduct fire investigation as required.

Item 18 - Indicate ammunition type used that caused the fire.

Item 19 - Indicate weapon system used that caused the fire.

Item 20 - Enter name of training unit that caused the fire.

Item 21 - Enter name of the OIC responsible for the training unit.

Item 22 - Enter the telephone number of the OIC of the training unit where he may be contacted in the event additional information is required.

Item 23 - Indicate if an AAR is required. If yes, AAR must be completed by the unit OIC and submitted to Range control prior to release or range clearance.

Item 24 - Remarks. Enter appropriate comments pertaining to subject wildfire incident, if any.

Item 25 - Enter date and name of individual filling out the fire report.

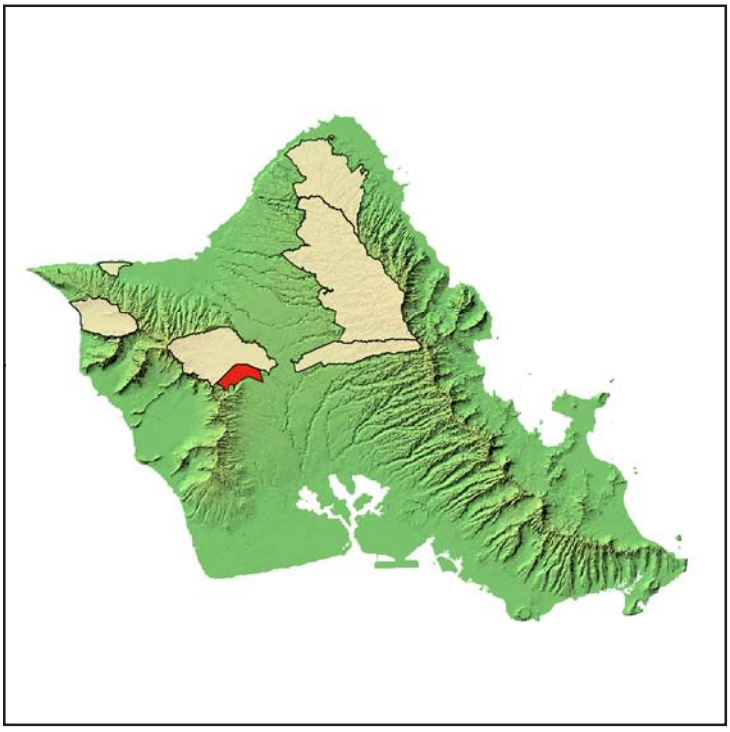
Item 26 - Enter date and name of the range supervisor reviewing the fire report. Range supervisor will review all fire incident reports for adequacy prior to submission to the wildland fire program manager.

FAX INSTRUCTIONS

A COPY OF ALL FIRE REPORTS WILL BE FAXED TO THE WILDLAND FIRE PROGRAM MANAGER WITHIN 24 HOURS AFTER THE FIRE INCIDENT IS REPORTED. ALL ORIGINAL WILDLAND FIRE INCIDENT REPORTS WILL BE MAINTAINED IN THE CURRENT FILE AREA OF EACH RESPECTIVE RANGE CONTROL OFFICE. A MAP MUST BE ATTACHED TO THE FIRE REPORT THAT IDENTIFIES AREAS BURNED.

SOUTH RANGE ACQUISITION AREA

STANDING OPERATING PROCEDURES



SOUTH RANGE ACQUISITION AREA WILDFIRE SOP

1. GENERAL.

1.1. Purpose.

a. The purpose of this Standing Operating Procedure (SOP) is to provide specific requirement that delineates the responsibilities of the Federal Fire Department, Range Control, and using training units in the prevention and suppression of wildland fires at South Range Acquisition Area (SRAA). Its primary objective is to prevent unplanned ignitions through sound preventive measures. It also establishes procedures toward fire control and the protection of natural/cultural resources from wildfires.

b. This SOP is a fire suppression guidance document for wildfire response at SRAA. It is intended to be used separately as a guidance manual by a responding wildland fire specialist, fire management officer, and/or Incident Commander (IC). See Figure SRAA-1 for an Overview.

1.2. Scope and Applicability.

a. The provisions outlined in this SOP are applicable to all military training units and personnel assigned to or utilizing SRAA. The installation commander and senior unit commanders, regardless of service or component, whose unit has been allocated the use of the maneuver training areas at SRAA, will ensure compliance with this SOP.

b. All officers and noncommissioned officers will familiarize themselves with the contents of this SOP prior to use of the range facilities. Considering the potential adverse effects of wildland fires, it is imperative that awareness on the part of all commanders is maintained and that all persons are instructed in fire prevention and fire suppression.

c. It is the intent of this SOP that all persons are made so aware, and that the instructions and guidance contained herein is employed with a view towards accomplishing training with an absolute minimum of needless, unwanted fire(s) and limited damage to natural/cultural resources. Fire prevention is the responsibility of every soldier, contractor, or other persons working or training at SRAA.

1.3. Responsibilities.

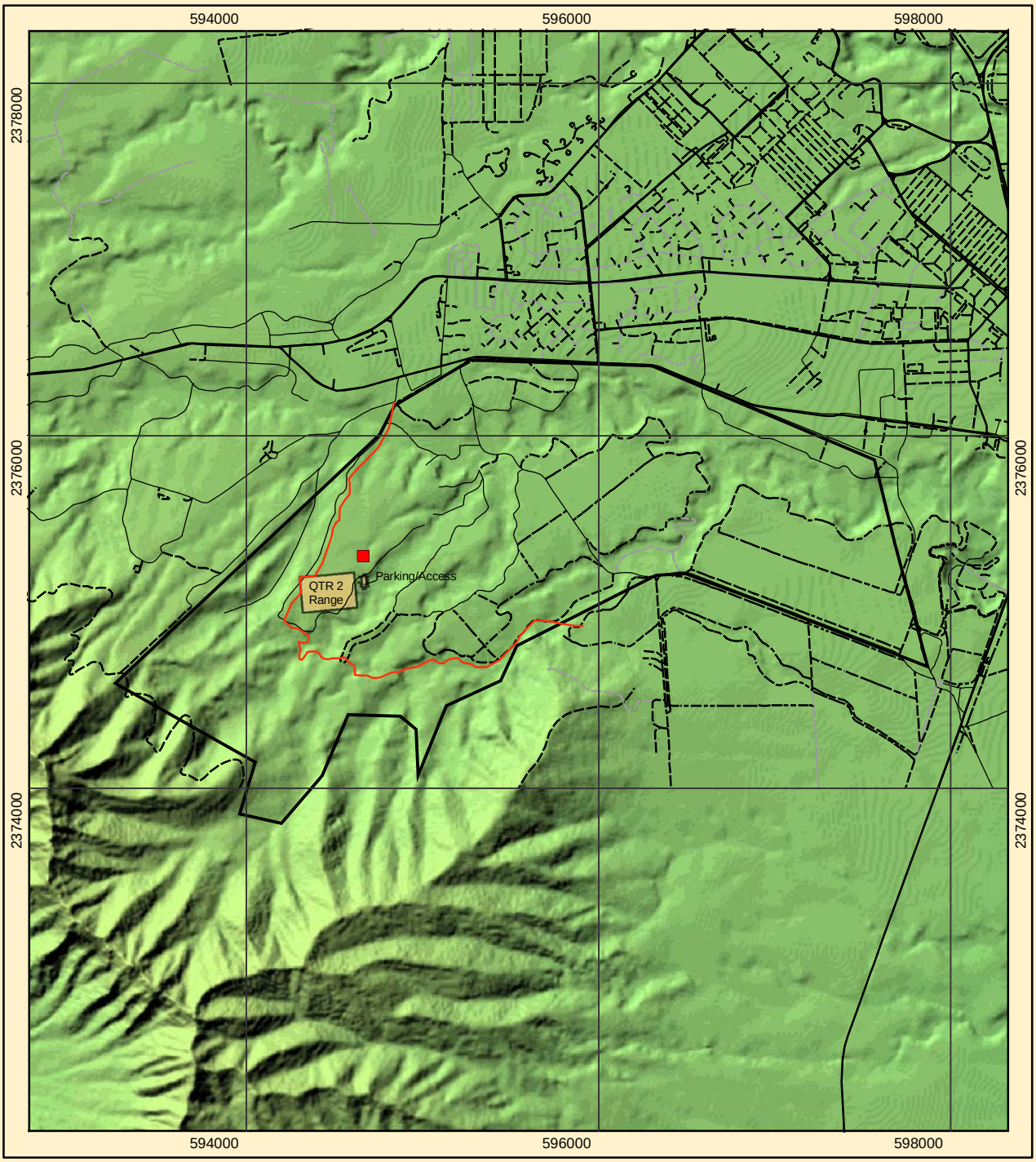
a. Installation Commander. The Installation Commander has the overall responsibility for fire prevention and protection requirements and environmental management at SRAA.

b. Director of Installation Fire and Safety Office. The Director of Installation Fire and Safety has overall responsibility for the wildland fire management program.

c. Fire Chief, Federal Fire Department (FFD). The installation Fire Chief is responsible for the organization, supervision, and management of all aspects of the fire prevention and protection program in accordance with the provisions of DoDI 6055.6, Fire Protection.

South Range Acquisition Area
Fire Suppression Resource Locations

Figure SRAA - 1



1:35,000

0 500 1,000 Meters

0 0.5 1 Mile

Data Source: USARHAW IFSO

Legend

- Proposed Firebreak
- Installation Boundary
- Ranges
- Surface Water Body
- Proposed Remote Automatic Weather Station

Roads

- Primary
- Secondary
- Tertiary
- Unimproved

d. Range Officer, G3/DPTM, Range Division Hawaii. The Range Officer has overall responsibility for enforcing the provisions of the Integrated Wildland Fire Management Plan (IWFMP) and other applicable training directives and regulations, including restrictions on or cessation of training activities based on the day's fire danger rating.

e. Range Operations Supervisor, Schofield Barracks. The SB Range Operations Supervisor is responsible to the Installation Commander for ensuring proper fire prevention measures are taken by troops in rear areas; fires, when discovered, are promptly reported; and augmenting the Federal Fire Department in fighting any fires on SRAA.

f. Wildland Fire Program Manager, IFSO. The Wildland Fire Program Manager is responsible for the execution of the Army's wildland fire program. Collaborates with other resource managers, FFD and other cooperative fire agencies to ensure that supplies, equipment, training, and qualified personnel are available to meet the goals and objectives of the IWFMP.

g. Unit Commanders and Division Chiefs. Commanders, managers, and supervisors at all levels of the organization are responsible for ensuring unit personnel are familiar with and comply with the provisions of this SOP and applicable regulations, fire prevention restrictions, training activities within biologically sensitive areas, providing qualified personnel to support the wildland fire management program.

1.4. Environmental Considerations.

a. Wildland Fires. Wildfires pose significant risks to threatened and endangered species of plants and animals and their native habitat. These habitats are located throughout the training ranges and adjacent to the SRAA installation boundary, though no federally listed species are known to exist inside of the proposed training area. Cultural resources, are present, but have not been accurately mapped. Significant threats to the archaeological sites at SRAA will likely be maneuvering activities, unmonitored ground disturbing activities, and vegetation clearance. Fire is also a potential threat to archaeological sites from fire suppression activities.

b. Applicable environmental laws mandate the protection and conservation of natural/cultural resources. The use of various ammunitions, weapon systems, pyrotechnics, vehicles, and the presence of humans all increase the risk of wildfire which is one factor that can destroy native habitat. The continued use of Army training lands in Hawaii greatly depends upon the Army's ability to reduce the number of fire starts and control fires within the installation boundary.

2.1 FIRE PREVENTION.

a. One of the primary objectives of this SOP is to integrate fire management actions with military training requirements and range operations. The prevention of fires is the responsibility of every individual training and/or working at SRAA.

b. Fire prevention and the ability to control the spread of fires is critical for the continued survival of endangered plants, animals and native ecosystems, and the Army's continued use of the area for military training activities. Currently, there are many instance where military operations conflict with the management of these special natural resources. These conflicts often result in reduced training capability as "WILDLAND FIRES STOP TRAINING". Fire

management actions are designed to reduce existing conflicts between necessary military training activities and the conservation of natural and cultural resources found within SRAA.

2.1. Education.

a. Soldiers will be briefed prior to training about fire prevention, and cultural and natural resource protection. The fire prevention briefing ensures that important information is provided to using individuals that may start wildfires.

b. Signs will be posted throughout various areas as reminders of prevention and awareness of the Fire Danger Rating System (FDRS).

c. The Integrated Training Area Management (ITAM) and Directorate of Public Works (DPW), Environmental Conservation Offices will provide training units with informational brochures to increase public and soldier awareness of the threat that wildfires pose to natural resource values.

2.2. Enforcement.

a. Range Control safety staff has the primary responsibility for ensuring that all regulations and SOPs are adhered to. Range Control and fire department personnel have the authority to stop training for noncompliance with any training regulation and/or this SOP.

b. Secondary responsibility rests with the using unit commanders.

c. Failure to follow range protocols will result in termination of scheduled training and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

2.3. Engineering.

a. Should SRAA be purchased, a firebreak will be constructed to contain all areas used for training.

b. Engineering projects on SRAA training areas shall be reviewed by the Wildland Fire Program Manager to ensure that fire prevention measures are considered during design, construction, or alignment of new ranges. Coordination with the G3/DPTM, Range Planner on engineering activities is essential to eliminate potential conflicts as related to fire prevention and fire safety.

c. An annual work plan identifying fire management projects by priority will be developed. This process will ensure that these projects (i.e., prescribed fire, maintenance of firebreak roads, herbicide, etc.) can be completed and will eliminate any conflicts between required maintenance of the ranges and military training activities.

2.4. Ignition Control.

a. All training will be subject to the fire danger rating system (see Section 3.1 and Enclosure 8 of this SOP).

b. Fuels management as described in Section 7.9.5 of the IWFMP will be implemented in part to reduce the chance of ignition.

3. PRE-SUPPRESSION ACTIONS.

3.1. Fire Danger Rating System.

a. A fixed Remote Automated Weather Station (RAWS) will be installed at SRAA. Schofield Barracks Range Control is responsible for retrieving weather data from the RAWS and archiving it into the WeatherPro software program. The Burn Index (BI), as determined by the National Fire Danger Rating System (NFDRS), will be used to rank fire danger to determine restrictions on pyrotechnic use, if any, in the maneuver training areas, and/or fixed training courses at SRAA.

b. BI's will be monitored hourly by Range Control when training exercises are scheduled at SRAA. Range control will notify the training unit of any training restrictions being imposed as a result of unfavorable fire danger ratings. Additionally, at any time that the BI changes from one category to another, the training unit will be notified immediately.

c. Hourly fire danger ratings will also be posted by the Range Control and this data will be made available to training units and will be used as the basis for making decisions concerning limiting the use of approved pyrotechnics on specific maneuver areas or fixed courses.

d. While training at SRAA, units must use caution during training exercises. Soldiers must be aware of and adhere to fire danger-rating restrictions of ammunition, pyrotechnics, smoking, and other ignition sources (see Enclosure 8). Strict compliance with training restrictions set forth herein will reduce the number of fire starts. The FDRS for SRAA is as follows:

Flame Length (ft)	***Burning Index***	***Fire Index Color***
0-11	0-48.9	Green
11+	49+	Red

e. Only two fire danger categories are necessary at SRAA. All munitions approved for use at SRAA are authorized under the Green Fire Index. All munitions, as well as smoking, and cooking/warming fires are prohibited under the Red Fire Index. For a full list of restrictions, see Enclosure 8 of this SOP.

f. The OIC in charge of the training unit will allow training to commence only after ascertaining the fire danger rating in effect and adopting the appropriate fire prevention measures.

g. Because there is currently no RAWS at SRAA, the FDRS is based on data from the Schofield Barracks Range Control RAWS located at CR-1. The FDRS will be updated when sufficient data from the planned SRAA RAWS has been collected to allow analysis.

3.2. Minimum Staffing Requirements.

a. Proper staffing and fire response of the FFD shall be in accordance with DODI 6055.6, Fire Protection Program.

b. An auxiliary wildland fire fighting force (Range Control) augments the FFD as first responders during initial attack operations on training ranges. At a minimum, wildland fire operations require two (2) trained Range Control personnel for each HMMWV response. This requirement is based on FFD response time from Station 14 and Station 15, located at Wheeler Army Airfield and Schofield Barracks and the safety and complexity of the fire fighting organization during initial/extended attack operations.

c. The Range Operations Supervisor will arrange work schedules to allow flexibility while ensuring that minimum staffing levels are met at all times, to include overtime authorizations. In the event of a fire, fire fighting duties take precedence over other work assignments.

d. At SRAA there is no requirement for aerial or ground fire fighting resources to be on site during training.

3.3. Training.

a. Policy requires that all Range Control and fire department personnel engaged in suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG). The Army's wildland fire program manager will coordinate with the FFD and Range Control staff to develop a certification-training program.

b. Individuals will not be assigned to duties for which they lack training and/or certified experience. All Range Control and fire department personnel dispatched or assigned to wildfires or prescribed fires will be qualified for the fire position assigned, unless assigned as trainees and under direct supervision of higher qualified personnel at all times.

c. The Wildland Fire Program Manager will administer and manage an effective qualification and certification program. He will monitor all employees' wildland fire management development (training and experience) to ensure accurate qualification and certification standards. All personnel engaged in wildland ground fire fighting activities must satisfactorily complete the following suppression skills courses as a minimum: S-110, Basic Fire Suppression Orientation; S-130, Firefighter Training; S-190, Introduction to Fire Behavior; and I-100, Introduction to Incident Command System (ICS).

d. The Army's Wildland Fire Program Manager will coordinate with the FFD training officer to develop the annual wildland training schedule. A recurring proficiency program will include quality instruction and evaluation of employee's proficiency level through quarterly training exercises that are monitored by the fire department training officer.

3.4. Fire Equipment and Supplies.

a. If at any time the required fire suppression equipment is not operational, training at SRAA will be suspended until all equipment is operational. Training will only be conducted when fully trained/certified personnel and well functioning equipment is available for fire suppression. This requirement pertains to all types of fire fighting equipment, water resources, and personnel.

b. The Wildland Fire Program Manager will maintain a cache of fire equipment in a constant state of readiness located at Building 1029, Area X, SBMR. The fire cache will contain a supply of fire hand tools, chainsaws, pumps, forestry hose, foam concentrate, etc., necessary to support fire suppression activities.

c. The Wildland Fire Program Manager will conduct periodic checks to ensure all resources are in place and will identify and immediately correct any deficiencies. The FFD District Chief shall coordinate with the Army's Wildland Fire Program Manager for equipment replacement.

d. Range control shall be responsible to coordinate with the Wildland Fire Program Manager for replacement of equipment.

3.5. Personal Protective Equipment (PPE).

a. It is mandatory that all fire fighting personnel assigned to SRAA be equipped with proper PPE (see Reference 4.2.2 of the IWFMP) necessary for combating wildfires. Range control personnel will ensure that proper PPE is worn at all times when actively engaged in fire fighting duties. Personal safety and prevention of injuries is the first priority in every fire management activity.

b. To ensure operational readiness during training exercises, range operations personnel assigned for fire fighting duties will be required to wear Nomex pants and wildland boots as part of their daily attire. This action will prevent delays and enhance response times to fire incidents at East Range.

c. PPE for training units during major wildfire incidents will be issued from the SBMR fire cache supplies. The fire cache will be maintained by the Wildland Fire Program Manager and shall be equipped to outfit a minimum of one hundred (100) firefighters with appropriate PPE.

3.6. Fire Response Vehicles.

a. One HMMWV from the SBMR Range Control equipped with 300-gallon slip-on pump unit (Class A foam capable) shall be assigned for initial attack response from SBMR.

b. Range control personnel operating fire response vehicles shall be qualified and licensed to operate emergency vehicles. The wildland fire program manager shall monitor vehicle qualification and training program for Range Control staff.

c. FFD response will be in accordance with FFD SOP's for wildland fire response, usually a brush company and water tender (1000-gallon capacity).

d. Range Control personnel will perform daily preventive maintenance inspection of fire vehicles and pumps to ensure operational readiness. All discrepancies shall be identified and annotated on DA Form 2404, Vehicle Discrepancy Inspection Checklist.

e. The SB Range Operations Supervisor will review all 2404's and coordinate with the Wildland Fire Program Manager. A Priority 03 and Force Activity Designator (FAD) III for replacement parts to support emergency fire equipment shall be assigned.

f. The Wildland Fire Program Manager will coordinate repairs with contracted vendors. Funding to support recurring maintenance and/or repairs shall be included in the annual Wildfire Program Management budget.

g. HMMWV's and pumpers/engines may refill at fire hydrants located along Lyman Road.

3.7. Helicopter Fire Bucket Support.

a. There is no requirement to have a dedicated helicopter for fire bucket operations on site at SRAA due to the type of training (non-live-fire).

b. Range Control will immediately notify the Installation Operations Center (IOC) upon determination by Range Operations Supervisor, the IC, or FFD that an extended attack situation exists and that a helicopter for fire bucket operations or additional fire fighting support is required. Refer to Enclosure 7 of this SOP, Fire Bucket Support Request Form.

c. Military helicopter units must provide their own fire buckets. Range Control currently maintains three BAMBI fire buckets [(2) 660-gallon and (1) 2000-gallon] for emergency backup use by military UH-60, CH-53, or CH-47 aircraft assigned to conduct fire bucket operations.

d. Range Control staff is responsible for ensuring that a serviceable primary and reserve BAMBI fire bucket is available for use by trained helicopter aircrews at all times. All discrepancies and the status of inoperable fire buckets will be immediately reported to Range Maintenance or the Wildland Fire Program Manager to coordinate immediate replacement or repair.

e. Until a 300,00 gallon capacity dip pond is constructed at SBMR, the helicopter crew must transient to an approved water resource site for water. The US Army has negotiated a 5-year lease with private landowners on the use of water reservoirs during training and major wildfires on Army lands. Refer to Section 5.7 of the IWFMP, Aviation Plan, for all approved water reservoir locations.

f. Air-to-ground radio communication must be established with the IC and helicopter support units involved in fire suppression activities. The capability for the IC to coordinate and direct air support with ground fire fighting crews is essential for safe and effective application. Refer to Section 5.6, Communication Plan and 5.7, Aviation Plan, of the IWFMP for assigned radio frequencies on Oahu.

3.8. Other Resources.

a. The U.S. Army Hawaii has entered into Cooperative Agreements and Mutual Aid Agreements with various federal, state, and local fire agencies. Refer to Appendix 2, Interagency Cooperative Agreements, of the IWFMP.

b. All agreements shall be reviewed annually and updated every five (5) years or as required.

4. FIRE SUPPRESSION PROCEDURES.

4.1. Fire Reporting and Notification Procedures.

a. Early fire detection and prompt reporting is critical in having an effective initial attack of wildfires at SRAA. All fires, regardless of size, will be reported immediately to Range Control and in turn, to the FFD. Units will follow the fire reporting procedures below.

b. In the event of a wildland fire on any maneuver area in SRAA, the unit OIC will immediately notify Range Control by the most expeditious means possible (radio or telephone), stating the exact location (grid coordinates) and the extent of the fire. The OIC will immediately initiate a “cease fire” order and remain in the area with the unit subject to the orders of the Range Control and/or FFD when they arrive on the scene. (Refer to Initial Attack Plan, Enclosure 3)

c. Once a fire is reported, training units will not be allowed to resume training until the fire is extinguished or upon approval by the Range Operations Supervisor and/or SFO of the FFD.

d. Failure to report any fire will result in termination of scheduled training and responsible individuals will be subjected to administrative disciplinary action in accordance with applicable regulations.

e. Upon notification of a fire, Range Control will immediately notify the Federal Fire Department by telephone (471-7117) and provide the exact location (grid coordinates), building or range number, maneuver area, or make a reference to a prominent terrain feature.

4.2. Initial Attack.

a. Immediate and aggressive response to all fires is an unconditional recommendation for SRAA. Within the confines of due care for personnel safety, the high resource values of the area justify the fullest commitment to expeditious containment and control of all fires. The difficult and often hazardous fire conditions warrant total initial effort to arrest fires in the early stages. Fiscal consideration must be secondary in ensuring timely and adequate availability of necessary fire fighting resources. In reality, the savings to be realized from a successful initial attack will offset the cost of many so called “over reactions”.

b. Direct Initial Attack (IA). Direct initial attack by military training units, trained Range Control staff or the fire department at the onset can suppress fires at the point of origin while still small and prevent fires from spreading. However, fuel loads and terrain conditions at SRAA currently limit safe and effective direct attack by fire crews in much of the area. Ground fire fighting crews can be effective for containing, or at least retarding the spread of fires until water/retardant drops from helicopters are on line. Direct attack with helicopter water drops can be very effective. Aerial fire bucket operations will be utilized to control fire in remote areas that are inaccessible to ground fire fighting teams.

c. Indirect Attack. In areas with heavier fuel loads, indirect attack incorporating existing natural barriers, roads and pre-constructed firebreaks should be the normal approach. Unless conditions of the particular incident determine otherwise, fuel within compartments isolated by natural barriers should be expeditiously burned out to reduce chances of fire escape. In areas with resource values at high risk of fire loss such as the Oahu tree snail, Achatinella habitat, opportunities to minimize area burned should be considered, provided it does not compromise

safety standards. With the progressive increase in fuel load, especially fine fuels, it is likely that requirements for pre-constructed firebreaks will also increase. Consequently, the trend will be towards indirect attack.

d. Upon notification of a fire by the training unit, the SB Range Control (firing desk) will notify other units training in proximity of the fire area. All other units will be placed in a “check fire” to alert units of current fire conditions and ensure awareness of fire suppression resources responding to the fire scene.

e. Trained Range Control fire crews will immediately proceed to the scene of the fire and assume command and control of all fire fighting activities. Range Control will direct fire suppression actions until properly relieved by the first arriving FFD unit. At this time, the fire will be evaluated as “Routine”, “Serious”, or “Critical”, defined as follows:

(1) Wildland Fires (ROUTINE). Wildland fires that can be handled by Range Control.

(2) Wildland Fires (SERIOUS). Wildland fires that may require the assistance of helicopters and/or military personnel under direct supervision of the FFD.

(3) Wildland Fires (CRITICAL). Wildland fires that will require the assistance of mutual aid and pose a critical threat to loss of high value resources and/or potentially may leave the SRAA installation boundary.

f. In the event fire escapes initial attack, the IC will implement an extended attack plan or fire escape contingency plan. (Refer to Chart A, Extended Attack Plan, page A-3-16; Chart B, Escape Fire Situation, page A-3-17; and Chart C, Monitoring Procedures, page A-3-18, of this SOP).

4.3. Command and Control.

a. The FFD will establish command and organize fire ground operations under the Incident Command System (ICS) and Unified Command during multi-agency response.

b. As the Incident Commander (IC), the District Fire Chief or the Senior Fire Officer (SFO) will establish a command post when it is anticipated or the fire incident is actually of serious or critical nature.

c. Once resources have been committed to fire fighting, they are under the control of the IC. The IC directs the overall employment of auxiliary fire fighting resources to contain and extinguish the fire. This does not preclude unit commanders from rotating personnel and equipment necessary for rehab. Particular attention must be given to the increased physical demand placed on fire fighting personnel during extended attack operations.

d. The IC will coordinate with Range Control and/or training units when requesting military assistance for combating major fires. The primary mission of the unit commanders in the geographical area will shift from training objectives to fire control.

e. The use of military personnel will only be authorized under the most extreme circumstances. When utilized, military personnel will be under the control of a qualified Range Control or fire department officer.

f. The IC will initiate action requesting mutual aid support from other fire agencies in accordance with established Cooperative Agreements when required.

g. Fires in the impact area with potential for escape and/or fires started adjacent to the SRAA boundary that have potential to carry fire into high resource value areas on SRAA justify the fullest commitment to aggressive containment and control of fires. The Army shall work with adjacent landowners to control fires before they encroach or escape the SRAA boundary.

5. POST FIRE ACTIONS.

5.1. Records and Fire Reports.

a. It is important that all fire incidents are documented to ensure accurate fire history of all fires on SRAA is maintained. Fire reports are used to track location, size, cause, frequency, and for fire trend analysis for future input and use in Geographical Information Systems (GIS).

b. Range Control will maintain a log of all fires on DA Form 1594, Daily Staff Journal or Duty Officer's Log. All fire incidents will also be assigned a fire number and officially recorded on the standard Wildland Fire Incident Report form for all Army training lands. A sample Wildland Fire Incident Report (WFIR) form is included in Enclosure 7 of this SOP.

c. The Range Operations Supervisor will review all fire reports for accuracy and proper completion of the Wildland Fire Incident Report. A copy of each report will be faxed to the wildland fire program manager at the earliest opportunity. DPW Environmental will forward copies of all Fire Incident Reports on fires that escape outside the East Range boundary to the U.S. Fish & Wildlife Service (USFWS).

d. Fire records will be kept on an automated computer database and maintained by the wildland fire program manager necessary for accurate fire history and fire trend analysis. The wildland fire program manager and DPW Natural Resource Manager will coordinate submission of semi-annual fire incident reports to USFWS NLT 10 July and 10 January of each calendar year.

5.2. Surveys.

a. In addition to the reports and reviews that are completed immediately after a wildfire, a post-fire analysis survey of the burned area may be required depending on the fire's location and vegetation damaged. The post-fire analysis may be combined with any of the informal or formal investigations. A post-fire analysis will need to determine either all or part of the following:

(1) The effect the fire may have had on native or alien flora and fauna resources and cultural resources.

(2) The effectiveness of the pre-suppression measures including fuel modifications.

(3) The effectiveness of the suppression resources and measures used.

(4) The effectiveness of the ICS.

(5) The effectiveness of fire/fuel models used.

(6) A safety review of suppression actions.

(7) A UXO contamination survey or potential UXO clean up operation.

b. A post-fire survey of the fire area will be conducted with the coordination of the DPW Environmental and ITAM office.

c. The effects of fire on threatened and endangered species or effects from catastrophic events must be surveyed at the earliest opportunity.

d. If during the survey, it becomes evident that a wildfire has affected BSA/SEA, or threatened any endangered species, the USFWS and the State of Hawaii, Division of Forestry & Wildlife (DOFAW) will be notified. If military training activities were determined to have caused the wildfire, the Army will reinitiate Section 7 consultation under the Endangered Species Act (ESA).

e. If a UXO survey or clearing operation is desired, coordination with the Explosive Ordnance Disposal (EOD) unit is necessary. Surveys or clearing operations must be planned, coordinated, and should be carried out immediately after a fire.

5.3. Investigations and Accident Reporting.

a. After Action Reports (AAR) will be conducted for fires of four hectares (ten acres) or more and/or during which unusual events occurred, to include failure to follow instructions.

b. The RDH will request a formal investigation for fires involving any of the following:

(1) Training related caused fires escaping or starting outside East Range boundary.

(2) Damage or loss of valuable property exceeding $1000.00.

(3) Damage of Biological Sensitive Area (BSA) or incidental take of plant or animal specie.

(4) All entrapments of fire shelter deployments.

(5) Major injury or fire fatality.

ENCLOSURE 1 FIRE PREVENTION BRIEFING

The following verbiage will be included in a general safety, environmental and fire prevention briefing to be given to all personnel before training at SRAA.

The purpose of this brief is to educate users of the range about the dangers of fire on the range. Fire prevention is the responsibility of every person working or training on the range. There are several reasons that fire prevention is so important. Fire poses a grave threat to endangered plants and animals at SRP. Fires also pose a danger of damage to archaeological sites. If a fire starts, all training must cease, and training downtime will result. For these reasons, every effort must be made to prevent range fires. In order to prevent fires, you must follow the following rules:

1. No lighted tobacco smoking materials will be discarded on the range. Smoking on the ranges is prohibited with the exception of the designated smoking area at the QTR2 parking lot and on roads or other barren surfaces.

2. Open fires are not authorized.

3. Heat tabs and similar commercial products must be used inside metal containers.

4. The use of smoke grenades or simulators is authorized, but must be used in such a manner that will not cause fires to ignite. This means do not place smoke grenades or simulators in vegetated areas. Place them in the dirt or in metal cans provided by Range Control.

5. Most weapons and pyrotechnics are not authorized for use at SRP. Check with Range Control.

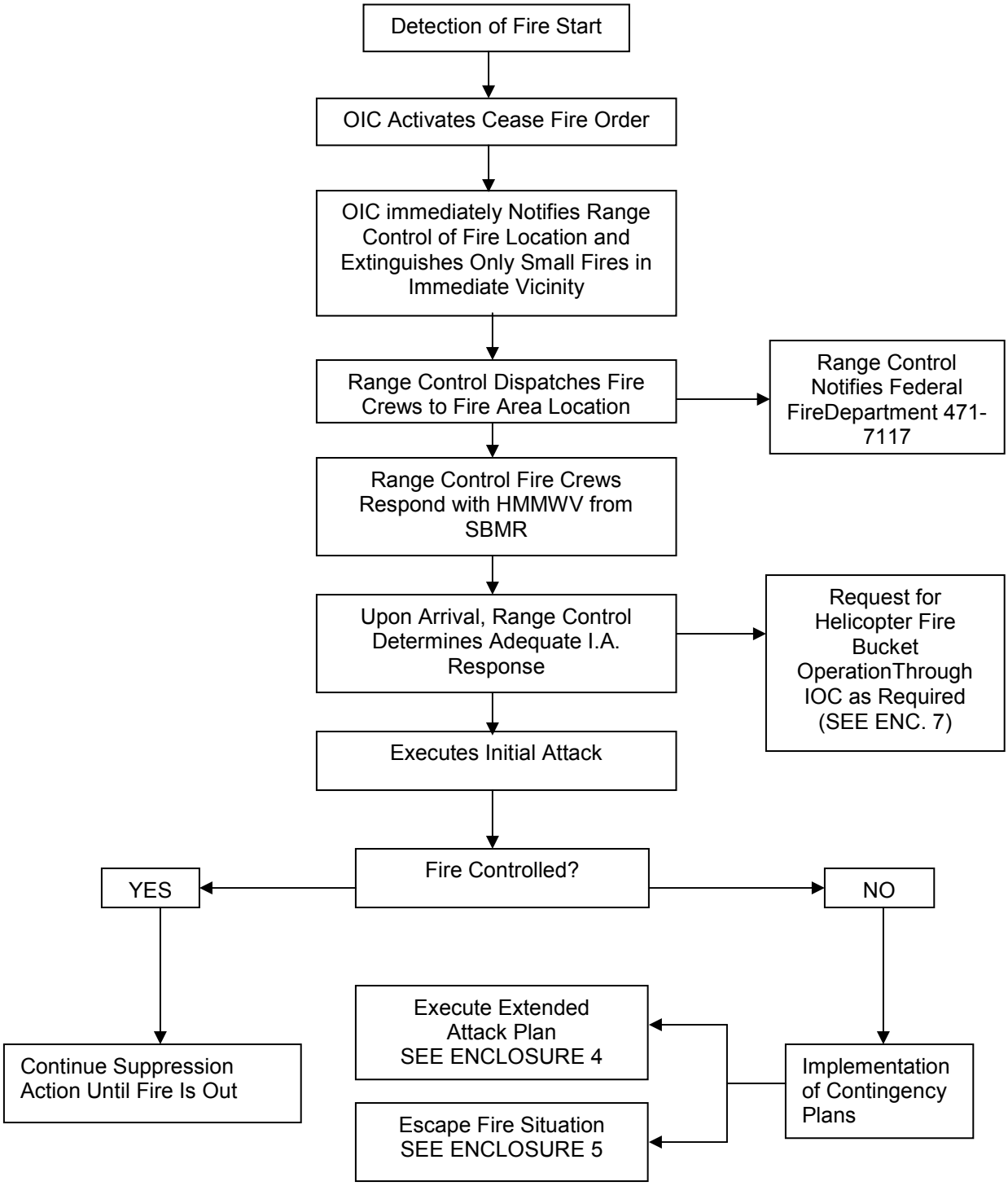
In the event a fire is started, cease training immediately. Range control must be notified immediately. Every safe effort must be made to put the fire out, and to do so as quickly as possible. Every resource available on the Range must be committed to this effort. These resources include the HUMMER Brush Engine fire trucks, and those of you that have been designated as part of the fire fighting team. Your unit leaders will advise you if you are on this team. In the event this fire fighting team is required, a trained safety technician will direct your work to put the fire out. The fire fighting team must be knowledgeable of safety and the proper use of backpacks and hand tools for fire fighting. When needed, this fire equipment will be issued at a site near the QTR2 firing line. (demonstrate the use of water backpack and fire swatter) Water for fire fighting is limited. If necessary, it will be made available by fire fighting personnel.

ENCLOSURE 2 NOTIFICATION LIST

AGENCY NAME	PHONE NO.
FEDERAL FIRE DEPARTMENT (Emergency)	471-7117
Communications Center & Dispatch	474-2222
Honolulu Fire Department (Emergency)	911
25th ID(L) & USARHAW	
Installation Operations Center (IOC)	655-8763/8764
	655-2962 (Fax)
G3/DPTM, Range Division Hawaii	
Range Officer	655-1404
Range Operations Manager, SB	655-5243/9509
Schofield Range Control (24-hrs)	655-2292
ITAM Coordinator	655-0582/8463
Installation Fire & Safety Office	
Director	655-3350
Fire Chief	655-1331
Wildland Fire Program Manager	656-0615
	286-5818 (Cell)
DPW, Environmental Office	
Chief, Environmental	656-2878, x-1062
Natural Resource Manager	656-2878, x-1050
Cultural Resource Manager	656-2878, x-1052
Oahu Biologist	656-7641/7741
U.S. FISH & WILDLIFE SERVICE	
Field Supervisor	541-3441
Fax	541-3470
STATE OF HAWAII, DEPARTMENT OF LAND & NATURAL RESOURCES	
Division of Forestry & Wildlife	
Oahu Branch Manager	973-9787/571-9999
State Fire Protection Forester	587-4173/571-0000

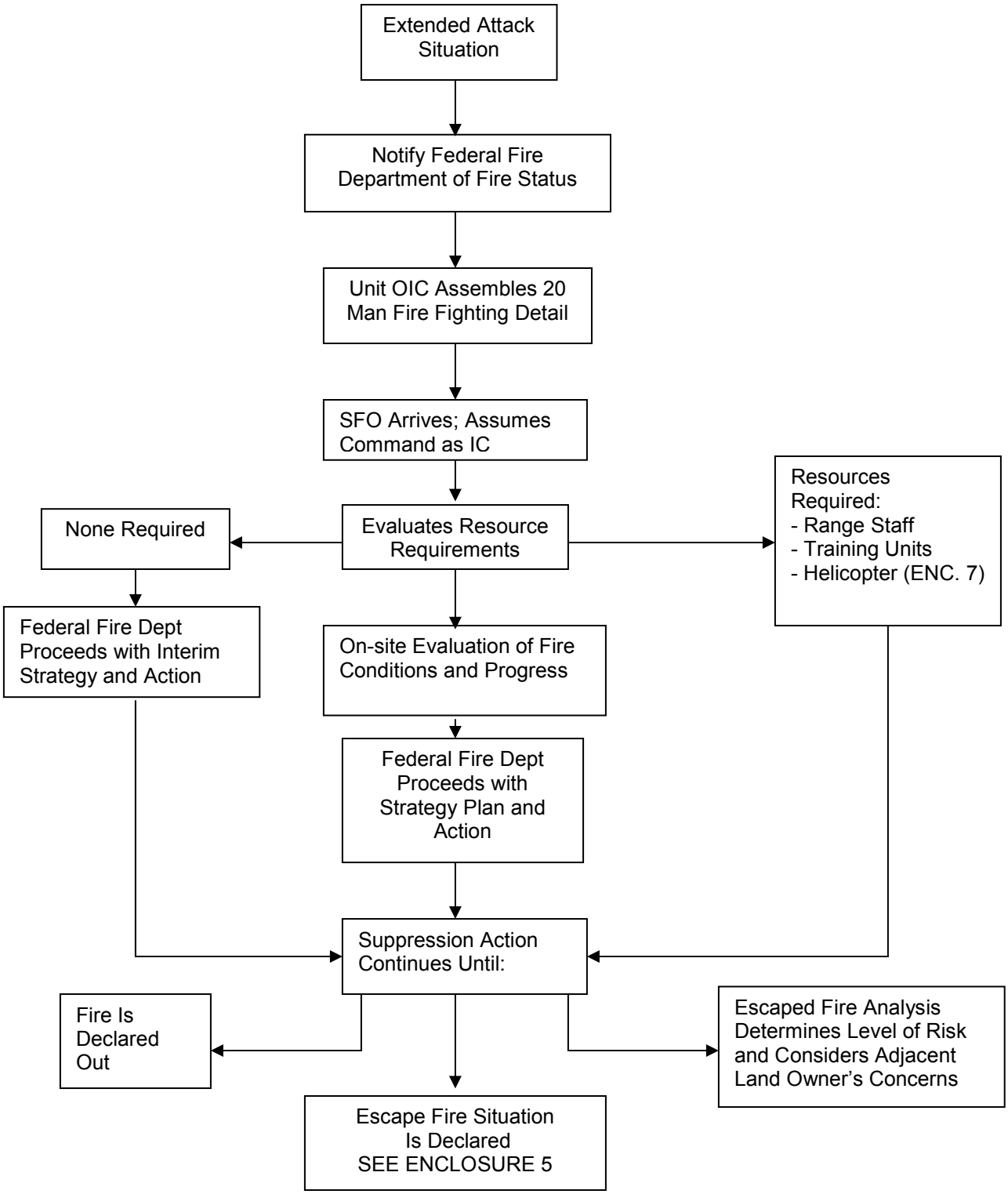
ENCLOSURE 3

SOUTH RANGE ACQUISITION AREA (SRAA)
OPERATIONAL DECISION CHART
INITIAL ATTACK PLAN



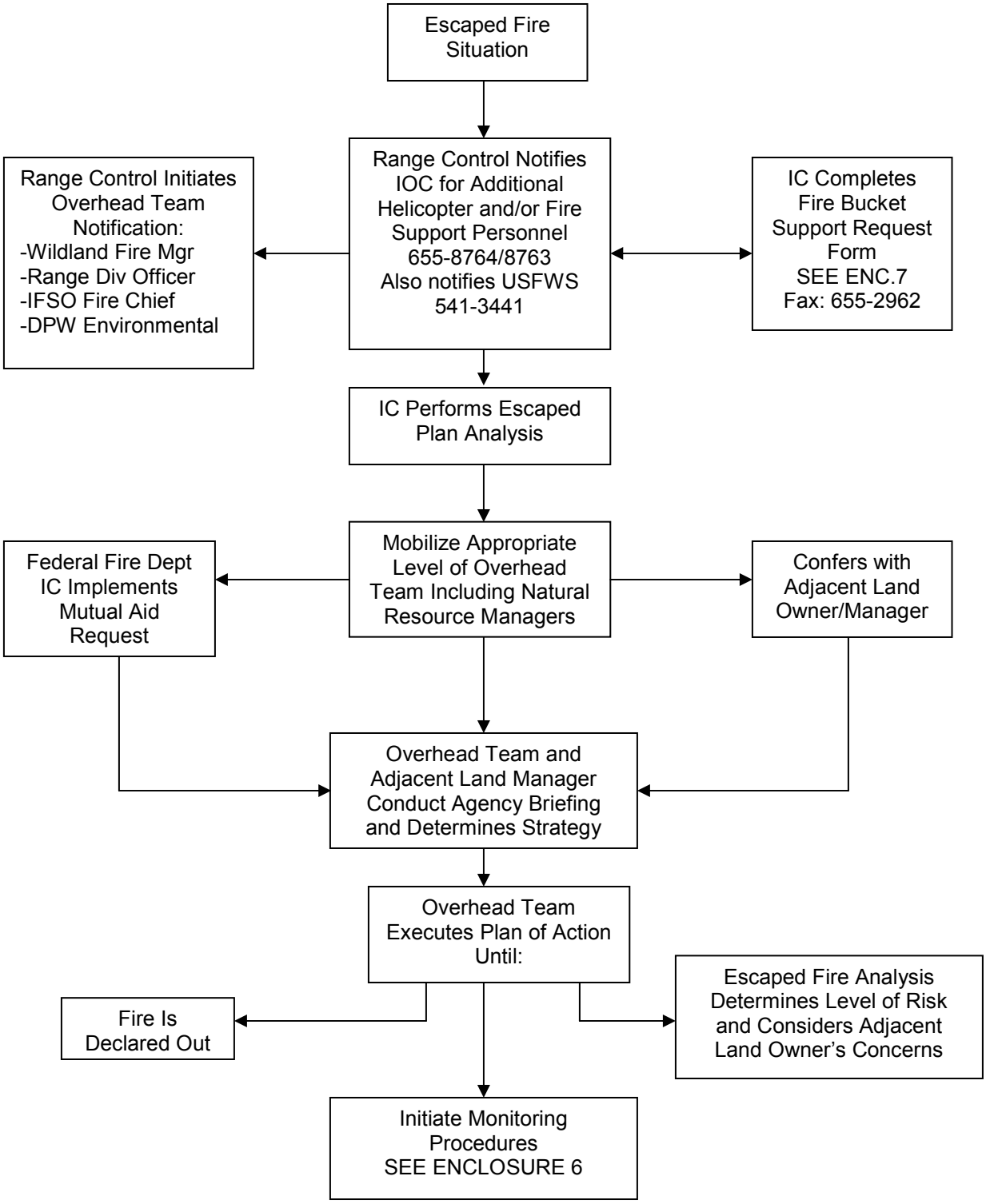
ENCLOSURE 4

SOUTH RANGE ACQUISITION AREA (SRAA) OPERATIONAL DECISION CHART A, EXTENDED ATTACK PLAN



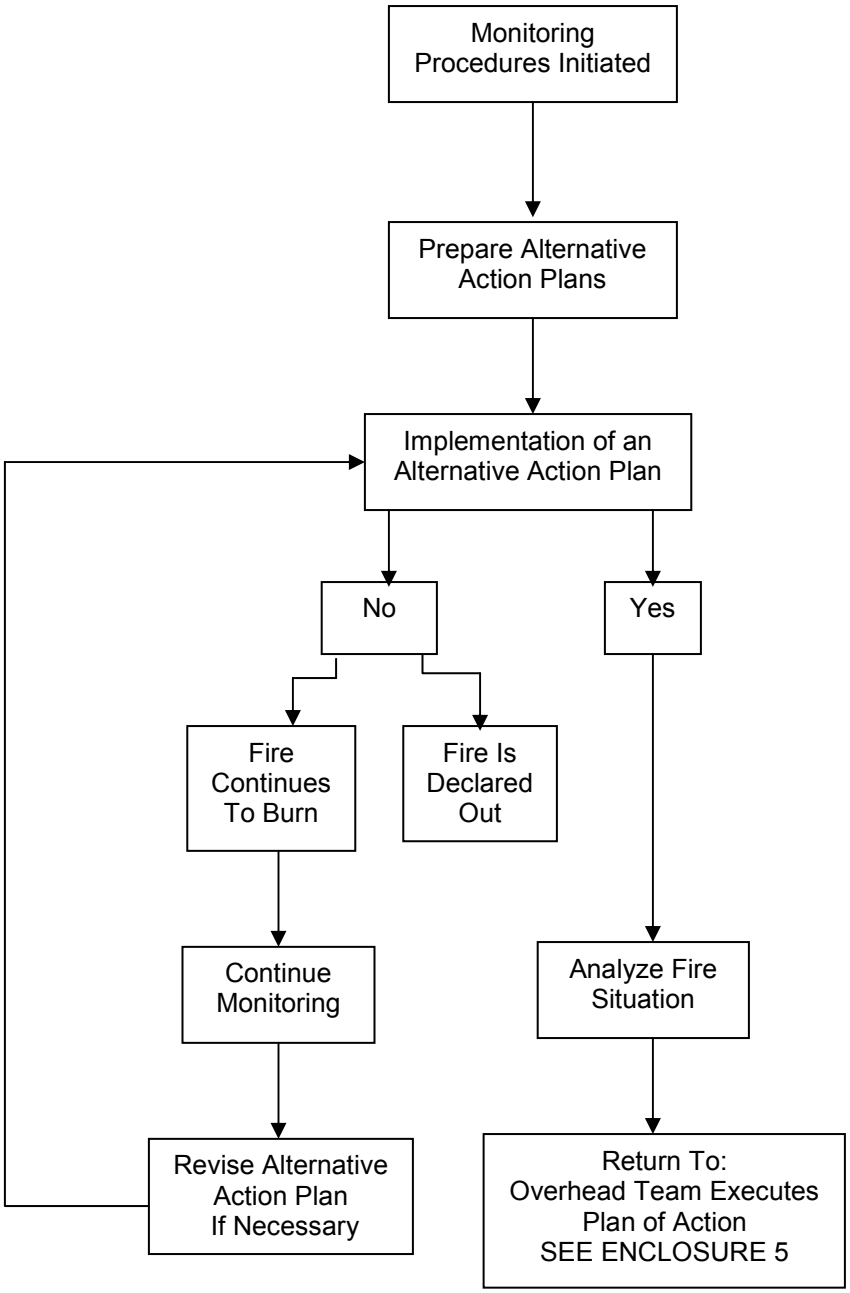
ENCLOSURE 5

SOUTH RANGE ACQUISITION AREA (SRAA)
OPERATIONAL DECISION CHART B
ESCAPE FIRE SITUATION



ENCLOSURE 6

SOUTH RANGE ACQUISITION AREA (SRAA)
OPERATIONAL DECISION CHART C
MONITORING PROCEDURES
(FIRES OUT OF CONTROL BEYOND SRAA BOUNDARY)



ENCLOSURE 7

25th ID(L) & USARHAW Reg 350-1

Request for Rotary Wing Aircraft Support

Date of Request:

REQUEST FOR ROTARY-WINGED AVIATION SUPPORT Proponent of this Form is G3, 25 ID(L) May 97		1. Late Request? Yes / No If Yes, Letter Incl? Yes / No
2. Requesting Unit:	3. POC and Ph# or Freq and Call Sign:	4. Submitted or Coord at AMAC/G3 Conf ?____ If Yes, Date:
5. Date(s) Required: 5a. Unit's Cycle:	6. Number and Type of Aircraft Requested: 1x UH 60	7. MSC or SEP BN S3 AIR:
8. Pick-Up Point(s)/PZ(s):	9. Destination(s)/LZ(s):	
10. Contact at PZ:	11. Contact at LZ:	
12. Pick-Up Time:	13. Release Time:	
14. Passengers:		
15. Cargo: (type, number, weight)		
16. Special Instructions or Mission Equipment: (e.g. Headphones, Cargo Hook, C2 A/C etc.)		
17. Mission Description: (who, what, when, where, why)		
18. Initial Planning Coordination: (when and where)		
AVIATION USE ONLY		
19. Mission Received From: (name, unit, date, time)		20. Mission Number
21. Mission Passed To: (name, unit, date, time)		
22. Mission Passed To: (name, unit, date, time)		
23. Mission Passed To: (name, unit, date, time)		
24. Number of Aircraft Assigned to Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
25. Estimated Number of Hours for Mission: AH-1 _____ CH-47 _____ EH-60 _____ OH-58 _____ UH-1 _____ UH-60 _____ OTHER _____		
26. Remarks:		

ENCLOSURE 8

FIRE DANGER RATING SYSTEM (FDRS) FOR SRAA

FIRE DANGER RATING	BURNING INDEX	FLAME LENGTH (FT)	CAUTION TO BE EXERCISED	RESTRICTIONS	HAZARD
GREEN	0-48.9	0-11	Use Normal Caution	None	LOW
RED	49+	11+	Use Extreme Caution	Live-fire on QTR2 authorized – Ball ammunition only. No Pyrotechnics, smoking, cooking/warming fires.	HIGH

ENCLOSURE 9 WILDLAND FIRE INCIDENT REPORT

WILDLAND FIRE INCIDENT REPORT

25TH ID(L) & USARHAW

1. INSTALLATION	2. INCIDENT NUMBER (YY-000)

3. DATE (YYMMDD)	4. FIRE LOCATION (Grid Coordinates 6 digits only)	5. RANGE OCCUPIED BY UNIT
	EJ	

6. TIME FIRE REPORTED	7. TIME FIRE OUT	8. TIME RANGE OPS RESPONDED	9. TIME FIRST SFO AT SCENE

10. AGENCY NOTIFICATION (*If applicable*)	PHONE	TIME CALLED	AT SCENE	REMARKS
❑ FEDERAL FIRE DEPARTMENT	471-7117			
❑ G3/RDH WILDLAND PROGRAM MGR	286-5818			
❑ INSTALLATION OPS CENTER (IOC)	655-8763			
❑ RANGE OFFICER	655-1404			
❑ RANGE OPERATIONS SUPERVISOR	655-9509			
❑ DPW NATURAL RESOURCE MGR	656-2878			
❑ U.S. FISH & WILDLIFE SERVICE	541-3441			
❑ (Other)				
❑ (Other)				

11. FIRE DANGER RATING	BURN INDEX (BI)	15. FIRE ESCAPE ANALYSIS	CHECK ONE	
			YES	NO
❑ GREEN ❑ YELLOW ❑ RED	13. EST. ACRES BURNED?	15a. FIRE STARTED OUTSIDE FIREBREAK ROAD?		
	14. > 10 ACRES? (AAR)	15b. FIRE ESCAPED FIREBREAK ROAD?		

16. HELICOPTER SUPPORT	16b. Aircraft Call Sign	Tail No.	16c. Arrived On Scene	Departed
☐ UH-60 ☐ CH-53 ☐ CH-46 ☐ CH-47 ☐ OTHER				
16a. BUCKET SIZE (*BAMBI*) ☐ 240-Gal ☐ 660-Gal ☐ 2000-Gal ☐ Other				

17. FIRE CAUSE (*Narrative*)	18. AMMUNITION TYPE	19. WEAPON SYSTEM
	❑ Tracer ❑ Mortar ❑ Artillery ❑ HE / WP ❑ Pyrotechnics ❑ Grenade ❑ Demo / Mines ❑ Other	❑ AT-4 ❑ TOW ❑ SAW / M-16 ❑ SMAW ❑ LAW ❑ Rocket / Missile ❑ M240/M60 ❑ Other

20. TRAINING UNIT	21. UNIT OIC	22. TELEPHONE	23. AAR REQUIRED?

24. REMARKS
(Narrative)

25. FIRE REPORT COMPLETED BY:	DATE	26. FIRE REPORT REVIEWED BY:	DATE

WILDLAND FIRE INCIDENT REPORT FORM
GENERAL INSTRUCTIONS

PURPOSE AND USE: Used in the administration of the Wildland Fire Management Program. The purpose of this form is to document all wildfire incident(s) on Army training lands under the jurisdiction of the 25th ID(L) and USARHAW within the state of Hawaii. This form will also be used to document when Army assets respond to any wildland fire incident outside of its jurisdiction in support of mutual aid requests. Documentation of all wildfires is necessary to ensure accurate fire history and trend analysis to assist fire managers in future fire management planning. The form becomes part of the permanent record file for each Fire Management Area (FMA). Fire records may be kept on an automated computer database as part of long term land management records. n

DISPOSITION OF FILES: The maintenance and disposition of all wildland fire incident reports shall be in accordance with Army record management policy. Disposition: a) OCE: Destroy after 25 years in CFA. b) Other Offices: Destroy after 5 years.

PROPONENCY: The proponent of this form is the Installation Fire & Safety Office (IFSO). Action Officer is the Wildland Fire Program Manager.

COMPLETION INSTRUCTIONS

Item 1 - Enter appropriate name of military installation where the fire occurred.

Item 2 - Fill in incident number. Enter 2 digit calendar year followed by 3 digits in numbered in sequence for the number of fires occurred during that calendar year.

Item 3 - Enter date of incident. Year, month, day (YYMMDD).

Item 4 - Fire location. Enter 6-digit grid coordinates that indicate where the fire started. Provide 6-digits only in blocks provided. *(Right, then Up)*

Item 5 - Enter range, firing point, or maneuver area the training unit causing the fire occupied at the time the fire started.

Item 6 - Enter the time of day the fire was first reported to Range control.

Item 7 - Enter the time of day the fire was reported extinguished.

Item 8 - Enter the time of day the first Range control fire crew/unit responded to the fire location.

Item 9 - Enter the time of day the first Range control fire crew/unit arrived at the fire scene.

Item 10 - Notification. Enter the time of day that Range Control first notified each agency or individual listed and enter the time each agency or individual arrived at the fire scene.

Federal Fire Dept:	Must be notified of all fires.
Wildland Fire Mgr:	Must be notified of all fires.
Installation Ops Ctr:	Notified if helicopter support or additional fire assets are required.
Range Officer:	Notified of all major fires only.
Range Ops Supv:	Must be notified of all fires.
Natural Res Mgr:	Notified if fires are potential threat to T&E plant or animal species.
USFWS:	Must be notified of all fires that escape firebreak road or installation boundary.
Remarks:	Enter appropriate comments if any.

Item 11 - Enter daily Fire Danger Rating.

Item 12 - Enter current Burn Index (BI) at the time of the fire start.

Item 13 - Enter total estimated number of acres destroyed by fire.

Item 14 - Enter YES if fire area is greater than 10 acres. The training unit OIC must submit an After-Action-Report (AAR) if fire area exceeds 10 acres. OIC must complete the AAR before clearing the range.

Item 15 - Fire Escape Analysis.
15a. Check Yes or No if fires started outside firebreak road.
15b. Check Yes or No if fires escaped the firebreak road.

Item 16 - Helicopter Support. Enter type of aircraft used on fire.
16a. Enter fire bucket size used on fire.
16b. Enter aircraft call sign tail number. (i.e., Hillclimber 150)
16c. Enter time of day aircraft arrived on scene and time aircraft departed.

Item 17 - Fill in narrative form any information as to the cause of the fire, ignition sources, or item known to have started the fire. DO NOT speculate. Validate with training unit OIC. Conduct fire investigation as required.

Item 18 - Indicate ammunition type used that caused the fire.

Item 19 - Indicate weapon system used that caused the fire.

Item 20 - Enter name of training unit that caused the fire.

Item 21 - Enter name of the OIC responsible for the training unit.

Item 22 - Enter the telephone number of the OIC of the training unit where he may be contacted in the event additional information is required.

Item 23 - Indicate if an AAR is required. If yes, AAR must be completed by the unit OIC and submitted to Range control prior to release or range clearance.

Item 24 - Remarks. Enter appropriate comments pertaining to subject wildfire incident, if any.

Item 25 - Enter date and name of individual filling out the fire report.

Item 26 - Enter date and name of the range supervisor reviewing the fire report. Range supervisor will review all fire incident reports for adequacy prior to submission to the wildland fire program manager.

FAX INSTRUCTIONS

A COPY OF ALL FIRE REPORTS WILL BE FAXED TO THE WILDLAND FIRE PROGRAM MANAGER WITHIN 24 HOURS AFTER THE FIRE INCIDENT IS REPORTED. ALL ORIGINAL WILDLAND FIRE INCIDENT REPORTS WILL BE MAINTAINED IN THE CURRENT FILE AREA OF EACH RESPECTIVE RANGE CONTROL OFFICE. A MAP MUST BE ATTACHED TO THE FIRE REPORT THAT IDENTIFIES AREAS BURNED.

Appendix 2

Interagency Cooperative Agreements

APPENDIX 2 – INTERAGENCY COOPERATIVE AGREEMENTS

AGENCY	TYPE OF AGREEMENT	DATE
Federal Fire Department Navy Region Hawaii	Interservice Support Agreement (ISA)	1995
County of Hawaii	Mutual Aid Support Agreement	1998
City & County of Honolulu	Mutual Aid Support Agreement	
National Park Service Hawaii Volcanoes National Park	Mutual Aid Support Agreement	1988
Division of Forestry & Wildlife	Mutual Aid Support Agreement	1985

These Agreements will be updated and reaffirmed as necessary.

SUPPORT AGREEMENT

1. DOCUMENT IDENTIFIER ("X" one) [X] NEW [ ] REVISION NO. ____ [ ] REVISION NO. ____ [ ] TERMINATION

2. SUPPLIER (Name, Office Symbol & complete address)
Commanding Officer
Naval Station
Pearl Harbor, HI 96860-6000
GEOGRAPHICAL AREA OR COUNTRY CODE: 15

2a. MAJOR COMMAND CODE: N00070
2b. SUBORDINATE COMMAND CODE: N53824
3. PRESENT AGREEMENT NUMBER: N62813-89230-109
3a. SUPERSEDED AGREEMENT NUMBER: N62813-83315-001
4. TERMINATION DATE (Month and Year): Aug 95

5. RECEIVER (Name, Office Symbol & complete address)
Headquarters
U.S. Army Support Command Hawaii
Fort Shafter, HI 96858-5000
GEOGRAPHICAL AREA OR COUNTRY CODE: 15

5a. DODAAC/FEDSTRIP NUMBER: WX3JP7
5b. MAJOR COMMAND CODE: W80N69
5c. SUBORDINATE COMMAND CODE: N/A

6. SUPPORT AGREEMENT RESOURCE SUMMARY

a. CATEGORY CODES	SUPPLIER b. MAN YEARS: MILITARY	CIVILIAN	c. Annual GROSS ADDITIONAL COSTS: TOTAL	NON-REIMBURSEABLE	REIMBURSEABLE
AH	0	45	Fire Protection	1,522,138	0
AJ	0	0	Housing	300	0
AP	0	0	Utilities	6,300	0
AW	0	0	Real Property	5,900	0
AX	0	0	Refuse	0	0
BC	0	0	Communication	0	0
BM	0	0	Entomology	0	0
BR	0	0	Training	0	0
SK	0	0	Fire Equipment	0	0
SN	0	0	Furniture	25,000	0
ST	0	0	Fuel	0	(7,000)
TOTAL	0	45	Noted	1,559,638	(7,000)

6d. RECEIVER DATA (When applicable, provide similar data required in blocks 6a, b and c)

7. SAVINGS ACCRUED/COSTS INCURRED/MAN YEARS SAVED/EXPENDED TO FEDERAL GOVERNMENT

7a. SAVINGS	7b. COSTS	7c. MAN YEARS SAVED	7d. MAN YEARS EXPENDED
FY:	FY:	FY:	FY:

8. FUNDING AND REIMBURSEMENT ARRANGEMENT (Include all details concerning billing/reimbursement procedures, funding limitations, and the appropriate "billing/submit thru" addresses. Also list those references which specifically apply to the type of organization being supported.)

A. NAVSTA PEARL will bill receiver through NAVCOMPT form 2277.

9. GENERAL PROVISIONS (Complete blank spaces): The following general provisions, as set forth in Chapter III, DOD 4000.19-M, apply to this agreement unless otherwise specified in "Remarks" block below:

a. The Receiving Activity will provide the Supplying Activity projections of support required to accomplish its mission. Significant changes in the Receiving Activity function, mission or support requirements will be submitted by the Receiving Activity in a manner that will permit timely modification of resource requirements.

b. It is the responsibility of each agency providing support under this agreement to bring any required or requested change in support to the attention of CO NAVSTA PEARL (Code 216) prior to providing/reducing unilaterally such additional/reduced support.

c. Activities providing reimbursable support in this agreement will submit a monthly statement of costs to CO NAVSTA PEARL (Code 015) for preparation of billing document, SF 1080.

d. Manpower required in support of this agreement which is subject to return to the lending activity upon termination of the agreement: None (Enter number or if no manpower is required, enter "None").

e. All rates expressing the unit cost of services provided in this agreement are based on current rates which may be subject to change for uncontrollable reasons, such as Congressional legislation, DOD directives, commercial utility rate increases, etc. The receiver will be notified immediately of such rate changes.

f. This agreement will be reviewed ~~XXXXXXX~~ *Triennially at least 120 days prior to the anniversary date. It may be revised at any time upon the mutual consent in writing of the parties concerned.

g. This agreement may be cancelled at any time by mutual consent of the parties concerned. This agreement may also be cancelled by either party upon giving at least 180 days written notice to the other party.

h. In case of mobilization or other emergency, this agreement will remain in force within supplier's capabilities, subject to normal cancellation provisions and will be subject to review at that time. This agreement will not be terminated if such action impairs the combat mission of the receiving activity as determined by higher headquarters.

10. REMARKS

a. NAVSTA point of contact is Mr. Rodney Bow at 474-3190.

b. Tenant POC is Mr. ~~David Hamamura~~ RON IZUMIGAWA at 438-2517.

c. This agreement will remain in effect during implementation of Operations Plan (OPLAN's).

Dist.
(1) COMNAVSURFPAC
(1) U.S. CINCPAC/J42, Box 20, Camp H.M. Smith, HI 96861-5025

*Triennially vice Biennially

11. COMPTROLLER CONCURRENCE (Supplier Signature & Date)	12. COMPTROLLER CONCURRENCE (Receiver Signature & Date)
S. HO, Comptroller 7/27/90	HERBERT A. MORIKAWA, Dir of Resource Mgt 12 Jul 90

13. TYPED NAME AND ORGANIZATION OF SUPPLIER APPROVING AUTHORITY	13a. SIGNATURE	13b. DATE
JOEL A. PORTER, CAPT, USN Commanding Officer	J.A. Porter	1 AUG 90

14. TYPED NAME AND ORGANIZATION OF RECEIVER APPROVING AUTHORITY	14a. SIGNATURE	14b. DATE
TIM LEONG DOL, USASCH	Tim Leong	16 JUL 90

S/N 0102-LF-001-1441

ASHORE COMMAND
AGREEMENT NUMBER
N62813-89230-109

GENERAL PROVISIONS (continuation)

i. The purpose of this agreement is to establish procedures to be followed in providing fire protection/crash rescue services at all installations under the U. S. Army Support Command, Hawaii on the Island of Oahu.

j. This interservice support agreement is written in compliance with AL5-16/Secretary of the Navy Instruction 4000.2B/Air Force Regulation 400-27 and Department of Defense 4000.19R.

k. Reimbursement to the Army will be accomplished by monthly submission of Standard Form 1080 bills by the Army for certification by the Commanding Officer, Naval Station, Pearl Harbor, Hawaii 96860 (or his designated representative). These bills will be supported by accountable records maintained by U. S. Army Support Command, Hawaii.

l. Fire prevention/protection services rendered by the Navy for the Army will be compatible with DOD/Navy regulatory requirements.

m. This agreement is subject to modification in accordance with the following:

(1) Request for modification will be furnished by one party to the other by written notice at least sixty (60) days prior to the effective date such modification is desired. Modifications to this agreement will be numbered.

n. All real property designated for use by Naval Station, Pearl Harbor will remain on the plant account of USASCH and will continue to be the maintenance responsibility of the Army.

o. For the purposes of this agreement Naval Station, Pearl Harbor, will be considered the Supplier and USASCH will be considered the Receiver.

p. In general, fuel for fire department vehicles will be obtained at the base where fire protection services are provided.

q. Specific provisions of support are listed in Appendix I.

INTERSERVICE SUPPORT AGREEMENT
BETWEEN
COMMANDING OFFICER, NAVAL STATION, PEARL HARBOR, HAWAII
AND
COMMANDER, U. S. ARMY SUPPORT COMMAND, HAWAII

CATEGORY	SUPPORT FUNCTION	NAVAL STATION WILL	USASCH WILL
AH	Fire Protection		
	1. Structural		
	a. Firefighting	a. Provide firefighting services for all USASCH installations on the Island of Oahu in compliance with COMNAVBASEINST 11320.3C series. Conduct investigations in conjunction with DFE, USASCH of all fires involving Army property excluding fires involving Army aircraft.	a. Comply with Fire Protection regulations, instructions and procedures. DFE, USASCH, in conjunction with Naval fire investigators, investigate all fires involving Army property excluding fires involving Army aircraft.
	b. Inspection	b. Inspections will be conducted on a continuing basis in accordance with existing standards (i.e., DODI 60-55.6). USASCH will be notified of discrepancies found during these inspections.	b. Responsible for corrective action on inspection discrepancies in Army facilities.
	c. Waivers	c. Make recommendations for fire prevention prevention discrepancy corrections. Provide technical expertise to draft waivers.	c. Authority to issue waivers for fire inspection discrepancy correction remains the responsibility of the command which maintains real property ownership of the facility.
	d. Portable Fire Equipment (Fire Extinguishers)	d. N/A	d. Provide replacement, repair and refilling of portable fire extinguishers in Army facilities. Visually inspect such equipment daily with a log entrymonthly to insure that it is in good working order.

CATEGO	SUPPORT FUNCTION	NAVAL STATION WILL	USASCH WILL
(cont'd)			
	e. Fire Alarm Circuits and Installed Sprinkler Systems	e. Maintain central fire alarm receiving system. Use installed systems for fire protection. Conduct test and inspections of fire alarm systems. The test of a system will be limited to the testing and shall not include line test or other maintenance test procedures. Submit to USASCH a written report of all malfunctioning systems and required maintenance requests. The installed systems at this activity shall be tested as follows: (1) Pull stations - Visual inspection - Test each initiating circuit once semiannually. (2) Coded Alarm System - Visual inspection - Test transmitter during inspection of facility. (3) Sprinkler flow alarm - Initiate inspection test valve during inspection of facility. (4) Carbon Dioxide Extinguishing System Alarm - Visual inspection. (5) Dry Chemical Dioxide Extinguishing Systems Alarm - Visual inspection. (6) Halogenated Extinguishing System Alarm - Visual inspection. (7) Heat and smoke Detectors - Visual inspection - Test heat detectors semiannually, rotation schedule - all tested semiannually.	e. Fund for repair and perform maintenance of these systems and install radio/fire alarm systems, as desired, to tie into the Federal Fire Department's Fire Alarm Center (Bldg. 167, Pearl Harbor Naval Shipyard). Inspect, test and maintain alarm circuits and installed protection systems in accordance with TM 5-697.

CATEGORY	SUPPORT FUNCTION	NAVAL STATION WILL	USASCH WILL
(cont'd)			

Note: Due to increased construction and upgrading of the fire protection systems at Tripler Army Medical Center, this department can only conduct visual inspections of all fire protection systems. Recommend that a maintenance service contract be prepared for the inspection, testing and repairs of all fire protection systems.

2. Aircraft Crash/ Rescue		
(a) Oahu	(a) Maintain a crash/rescue posture on a 24-hour schedule in compliance with DOD/Navy criteria at Wheeler AFB. Also provide crash/rescue support for VIP and MEDEVAC helicopter operations at Fort Shafter, Schofield Barracks, Tripler Army Medical Center, Helemano and Kahuku, if required. Dillingham Air Field helicopter night operations will be on a cost reimbursable basis. Crash/Rescue standby operations are normally provided at Fort DeRussy by the City/County Fire Department. When the City/County cannot provide this protection the supplier will provide the service on a cost reimbursable basis.	(a) Comply with fire protection regulations, instructions and procedures Receiver will fund for all overtime incurred during night flying operations at Dillingham Air Field. Fund for any crash/rescue effort required at Fort DeRussy.
3. Brush		
(a) Ground Operations	(a) Provide fire fighting services for all USASCH installations/training areas on Oahu in compliance with DOD/Navy criteria, recognizing Hawaii State Forestry Division concerns.	

CA.CO.	SUPPORT FUNCTION	NAVAL SHIPYARD ROLE	SENDER ROLE
(cont			
	(b) Air Operations	(b) Coordinate requests for airborne fire bucket support through 45th Support Group.	(b) Provide CH-47 and/or UH-1 helicopter support as available.
	(c) Standard Operating	(b) Provide receiver with current written standard operating procedures.	
	4. Submission of Reports	Submit reports, i.e., responses, standbys, and fire losses to USASCH, in accordance with DOD criteria.	Prepare/transmit fire reports as required.
	5. Fire Hydrants	Conduct annual flow test of all fire hydrants in accordance with existing instructions. Maintain records of these flow tests and provide to Receiver as requested. Notify appropriate agency/ department of any maintenance required.	Provide maintenance as required. Provide annual flushing of all hydrants and number all hydrants in accordance with maps and drawings.
AJ	Housing and Lodging		
	1. Bedding, furniture, etc.	1. Budget for replacement equipment as necessary.	1. N/A
AP	Utilities		
	1. General	1. Comply with USASCH utilities conservation policies.	1. Fund for all utilities.
AW	Real Property Maintenance		
	1. General Maintenance	1. Notify USASCH of requirements.	1. Fund and manage specific and cyclical maintenance of fire stations as required. Establishes priorities and decides on level of funding, SEE APPENDIX II.

ITEM	SUPPORT FUNCTION	NAVAL STATION WILL	USASCH WILL
(cont'd)			
	2. Construction/ Alteration of Fire Department Facilities	2. Submit requirements to USASCH.	2. Perform this function or submit requests to higher authority as applicable.
AX	Refuse Collection and Disposal		
	1. Groundskeeping (Grass cutting and tree trimming.)	1. Fire Department personnel will maintain grounds in the immediate vicinity of the station facilities (50 feet around the facility or to the nearest natural break (e.g., street curb, fence line, etc.).	1. Provide equipment/supplies as necessary.
	2. Trash	2. Submit requirements to USASCH.	2. Fund for this service.
BC	Communications (Telephone Service)		
	1. Telephone services which include relocation and installation of standards type equipment.	1. Notify USASCH of requirements.	1. Fund for OTS telephone service in fire stations located on Army property. Fund for relocation of fire reporting numbers and/or adoption of Federal Fire Department fire reporting number.
	2. Rental/purchase of standard telephone equipment and mainline telephone usage (local).	2. Notify USASCH of requirements.	2. Fund for OTS service.

CATEGORY	SUPPORT FUNCTION	NAVAL STATION WILL	USASCH WILL
(cont'd)			
	3. Toll calls and Mission-Peculiar Requirements	3. N/A	3. Provide official telephone (Class A-1) service in accordance with existing regulations on a nonreimbursable basis.
	4. Radio Frequency Support	4. Provide radio frequency support for all Fire Department radios installed and/or maintained on Army installations. This includes submission of frequency proposals to modify existing records to reflect Navy vice Army assignments. Provide annual justification to Receiver for Army frequencies.	4. Submit frequency change requests for Army frequencies in accordance with applicable directives.
	5. Radio Maintenance Support	5. Provide radio maintenance for all Federal Fire Department radio equipment.	5. N/A
8M	Entomology Services		
	1. General	1. Notify USASCH of requirements.	1. Fund for these requirements and for recurring requirements presently programmed for the facilities.
8R	Training		
	1. General	1. Provide fire prevention training upon request of the Receiver. Identify fire prevention literature required, notify USASCH of requirements.	1. N/A
		2. Provide fire fighting/crash rescue crew with truck to participate in USASCH nuclear/chemical accidents/incidents and training exercises.	2. Provide technical advice and assistance in Army nuclear/chemical accident and incident procedures, and notify Supplier 72 hours prior to training exercises.
		3. Ensure all crash rescue firefighters are trained per the requirements of NAVAIR 00-80OR-14.	3. N/A

CATEGORY	SUPPORT FUNCTION	NAVAL STATION WILL	USASCH WILL
SK	Firefighting Equipment and Components		
	1. Equipment Maint	1. Maintain fire fighting equipment received.	1. N/A
SN	Housing and Office Appliance, Equipment, and Furniture		
	1. Supplies (General)	1. Request for supplies and fire literature.	1. Provide supplies and fire prevention literature. (See paragraph 8R1)
ST	Petroleum, Oils, Lubricants, and Chemicals		
	1. Fuel	1. Reimburse the Army for fuel used by Fire Department vehicles. Report through Navy channels the fuel issued to the Navy as a Navy consumption.	1. Provide fuel on a reimbursable basis.

LIST OF BUILDINGS

1. For sole oocupancy by the supplier:

BUILDING NO.	AREA
494	Schofield Barracks
494A	Schofield Barracks
320	Tripler Army Medical Center
108	Helemano Military Reservation

ESTIMATED PERSONNEL COST

	QTY	GS GRADE	BASE PAY (STEP 5)	TOTAL
	4	9	$27,026	$108,104
	4	7	22,093	88,372
	8	6	19,882	159,056
	8	5	17,838	142,704
	21	4	15,943	334,803
TOTAL	45			$833,039
			25% Premium Pay	208,260
			22.5% COLA	187,434
			21.4% Fringe Benefits	178,270
			13% Overtime (of Base)	108,295
			Uniform Allowance ($125 x 45)	5,625
			Safety Shoes ($27 x 45)	1,215
			TOTAL	$1,522,138

ESTIMATED RESOURCE COST (RECEIVER)

CATEGORY CODE	TOTAL	NON-REIMBURSEABLE	REIMBURSEABLE
AJ	$ 300	$ 300	-0-
AP	6,300	6,300	-0-
AW	5,900	5,900	-0-
SN	25,000	25,000	-0-
ST	7,000	-0-	$7,000
TOTAL	$44,500	$37,500	$7,000

REQ NO HAW 060
N62813-89230-109

STRIBUTION:
JR, US ARMY PACIFIC COMMAND
ATTN: APLG-PM
FT SHAFTER, HI 96858-5100
CDR, 25TH INFANTRY DIVISION (LIGHT)
ATTN: APVG-LG
SCHOFIELD BARRACKS, HI 96857-6000
CDR, 45TH SUPPORT GROUP
ATTN: APGP-LG
SCHOFIELD BARRACKS, HI 96857-5200
CDR, U.S. ARMY LOGISTICS EVALUATION
AGENCY, ATTN: LEP/DRIS STUDIES
OFFICE, NEW CUMBERLAND ARMY DEPOT,
NEW CUMBERLAND, PA 17070-5007

DFE
DPCA
DPTM
DOIM
FSCC
DRM
DOL (AS FOLLOWS):
MAINT DIV
TRANS DIV
SUP/SVC DIV

MUTUAL AID FIRE-FIGHTING AGREEMENT FOR

FIRE PROTECTION ON THE ISLAND OF HAWAII

This agreement made and entered into this 31st day of August, 1998 by and between the Mayor, County of Hawaii, State of Hawaii and the Secretary of the Army, each consenting to the terms of this Agreement bears witness that:

WHEREAS, the Secretary of the Army acting according to the authority of section 1856a, Title 42, United States Code and the Mayor, County of Hawaii desire to secure the benefits of mutual aid in fire prevention, and the protection of life and property from fire; and

WHEREAS, the ARMY fire-fighting force protects Pohakuloa Training Area and Kilauea Military Camp situated adjacent to civilian communities on the Island of Hawaii; and

WHEREAS, the COUNTY maintains a fire department to protect the civilian communities on the Island of Hawaii, including those situated adjacent to the military installations which are protected by the ARMY fire-fighting force; and

WHEREAS it is recognized that potential conflagration and disaster hazards exist in each of the adjacent/nearby areas which are conceivably beyond the fire-fighting capabilities of either the ARMY or the COUNTY to control individually;

NOW, THEREFORE, in the interests of public safety, health, and welfare, the ARMY and the COUNTY do mutually agree as follows:

ARTICLE I – ARMY ASSISTANCE

In the event that fire-fighting assistance is needed, the COUNTY will place its request with the Fire Chief of the ARMY post from which the assistance is requested. Any request for aid under this agreement will specify a location for the ARMY to send fire-fighting forces; however, the ARMY will determine the amount and type of equipment and the number of personnel dispatched. The COUNTY will release ARMY firefighters and equipment when their services are no longer required, or when the ARMY needs them within the area for which it normally provides fire protection.

In exigent situations where immediate assistance is required to save lives, prevent human suffering, or mitigate great property damage, the ARMY will provide assistance upon request of the COUNTY. Assistance by the ARMY is limited to fires within 25 road miles of Pohakuloa Training Area or 10 road miles from Kilauea Military Camp. The ARMY will only provide assistance in this area if the COUNTY's fire-fighting resources are not adequate to cope with the situation.

In the event of a large brush fire in the immediate vicinity of Pohakuloa Training Area, the ARMY will assist the COUNTY in controlling or containing the fire from spreading onto the Pohakuloa Training Area.

Should a fire occur in the civilian community due to military maneuvers or encampment, or because of the firing of weapons from within the Pohakuloa Training Area, the ARMY will respond with sufficient fire-fighting equipment and personnel to put out the fire.

The ARMY agrees to provide first alarm response to civilian communities where the ARMY fire-fighting force is the nearest source of fire apparatus, when so requested by the COUNTY insofar as requirements permit.

The ARMY has sole discretion to release a military helicopter with a water bucket to combat fires in locations inaccessible to the COUNTY fire department. The use of a helicopter is limited to conditions, which imminently threaten human life, human suffering, or major property destruction. Military helicopters on the Island of Hawaii are Oahu-based aircraft, and they are unavailable except during a field exercise or when certain troop units train at the Pohakuloa Training Area. The ARMY does not retain helicopters on standby for fire suppression on the Island of Hawaii.

The COUNTY further agrees to request personnel and a helicopter with a water bucket through the ARMY fire chief or his designated senior fire officer of the Pohakuloa Training Area. The COUNTY will only make such requests when large brush or forest fires exceed the fire-fighting capabilities of the COUNTY. The ARMY will dispatch personnel and a helicopter only as the situation requires and to the extent that personnel and equipment are available on Hawaii. The ARMY fire chief and senior fire officer of the Pohakuloa Training Area remains subject to the orders of their established chain of command at all times.

The ARMY will equip and operate fire-fighting forces in accordance with pertinent Directives of the Department of Defense. ARMY firefighters will comply with laws & ordinances of the State of Hawaii and the County of Hawaii.

The rendering of assistance under the terms of this agreement shall not be mandatory, but the ARMY will immediately inform the COUNTY whenever the ARMY cannot render assistance.

ARTICLE II – COUNTY ASSISTANCE

Upon request by the ARMY, the COUNTY agrees to dispatch available fire-fighting personnel to any point within the fire-fighting jurisdiction of ARMY installation fire departments at Pohakuloa Training Area and Kilauea Military Camp. The COUNTY will provide assistance insofar as other COUNTY requirements permit.

Any request for aid under this agreement will specify a location for the COUNTY to send fire-fighting forces; however, the COUNTY will determine the amount and type of equipment and the number of personnel dispatched. The ARMY will release COUNTY firefighters and equipment when their services are no longer required, or when the COUNTY needs them within the area for which it normally provides fire protection.

The COUNTY further agrees to provide fire-fighting service to Keaukaha Military Reservation, U.S. Army Reserve Center at Hilo and the military area at Kawaihae Harbor. Such service shall include provisions of first alarm, as well as multiple alarm response in accordance with predetermined assignments.

The COUNTY will equip and operate fire-fighting forces in accordance with pertinent Directives of the Department of Defense. COUNTY firefighters will comply with laws & ordinances of the State of Hawaii and the County of Hawaii.

The rendering of assistance under the terms of this agreement shall not be mandatory, but the COUNTY will immediately inform the ARMY whenever the COUNTY cannot render assistance.

In deference to the requirements of the Department of Defense relative to the release of public information, all requests for information concerning fires at military installations will be referred to the ARMY commander of the Pohakuloa Training Area for coordination of the response with the ARMY Public Affairs Office. Employees, agents, or officers of the COUNTY will refrain from releasing fire status information to the communications media. Likewise, the ARMY will not comment on fires in civilian communities, but will refer the communications media to the COUNTY information officer.

ARTICLE III – COMMAND & CONTROL PROCEDURES

A responding organization will report to the officer in charge of the requesting organization at the location to which the equipment is dispatched, and will be subject to the orders of the official of the requesting organization. Fire-fighting operations on military installations shall be conducted under the direction of the responsible ARMY fire chief or his assistant. In the civilian communities, fire-fighting forces will operate under the direction of the fire chief of the COUNTY fire department.

The fire chief of the COUNTY fire department, or his designated assistant, shall direct all fire-fighting operations at the Keaukaha Military Reservation, U.S. Army Reserve Center at Hilo, and the military area at Kawaihae Harbor. The COUNTY will surrender control over fire-fighting operations at the aforementioned installations when an element of the ARMY fire-fighting force is stationed at the installation for first alarm response during a contingency.

If a crash of aircraft owned or operated by the United States or military aircraft of any foreign nation occurs within the area for which the COUNTY normally provides fire protection, the Chief

of the nearest ARMY installation or his or her representative may assume full command of the crash scene.

The technical heads of the fire departments of the parties to this agreement are authorized and directed to meet and draft any detailed plans and procedures of operation necessary to effectively implement this agreement. Such plans and procedures of operations shall become effective upon ratification by the signatory parties.

All equipment used by the COUNTY fire department in carrying out this agreement will be owned by the COUNTY fire department. All personnel acting for the COUNTY fire department under this agreement will be an employee or volunteer member of the COUNTY fire department.

ARTICLE IV – TRAINING

Both parties agree to take advantage of education and training opportunities for their fire-fighting forces whenever the Federal Emergency Management Agency provides it.

The COUNTY agrees to permit personnel of the ARMY to attend fire-fighting training classes and/or use its training facilities on a space available basis without cost to the ARMY.

The ARMY agrees to permit personnel of the COUNTY to attend fire-fighting training classes and/or use its training facilities on a space available basis without cost to the COUNTY.

The chief fire officers and personnel of the fire departments of both parties to this agreements are invited and encouraged, on a reciprocal basis, to frequently visit each other's activities for guided

familiarization tours consistent with local security requirements and, as feasible, to jointly conduct pre-fire planning inspections and drills.

ARTICLE V – COMMUNICATIONS

The COUNTY and the ARMY agree to provide direct line telephone service and radio communication between the COUNTY fire service and the ARMY fire-fighting force. The parties may exchange radio equipment on a loan basis to maintain two-way radio communications. The parties may use the COUNTY Fire Communications Net (154.955).

The ARMY agrees to permit the COUNTY fire department to enter the base command communications net (173.5125) to contact the military commander regarding any civilian fires covered by this agreement. The COUNTY may also enter the Tenant Unit Communications Net (38.30) and the air-to-ground communications net (38.30) when assisting the ARMY fire-fighting force in combating a fire at the Pohakuloa Training Area.

ARTICLE VI – WAIVER OF CLAIMS AND REIMBURSEMENT FOR OPERATING EXPENSES

Each party hereby waives all claims against the other party for compensation for any loss, damage, injury or death occurring as a consequence of the performance of this agreement except those claims authorized under 15 U.S.C. § 2210. This waiver complies with federal law codified at 42 U.S.C. § 1856a.

The ARMY may claim reimbursement for the direct expenses and losses, which are additional fire-fighting costs above the normal operating costs, incurred while fighting a fire under this agreement at the request of the COUNTY.

Over and above normal operating expenses means costs, losses, and expenses which are not ordinarily and necessarily associated with the maintenance, administration and day-to-day operations of a fire service, and which would not have been incurred absent the fire out of which the claim arises.

The COUNTY may file a claim for reimbursement, as provided in 44 C.F.R. Part 151, to the Director, FEMA, Washington, DC 20472. The COUNTY must submit its claim in writing within ninety (90) days of the occurrence of the fire for which a claim is made.

The ARMY may request reimbursement directly from the COUNTY.

ARTICLE VII – SUSPENSION AND TERMINATION

This mutual aid agreement is suspended whenever fires on the island of Hawaii result in the activation of the Joint Standard Operating Procedures for Mutual Civil Emergency Support in the State of Hawaii. This agreement is likewise suspended during disaster declarations made by the President of the United States under Public Law 93-288 (Stafford Act) as amended by Public Law 100-707.

This agreement shall become effective upon the date hereof and remain in full force and effect until cancelled by mutual agreement of the parties hereto or by written notice by one party to the other party, giving thirty (30) days notice of said cancellation.

The ARMY and the COUNTY agree to review and update this agreement biennially. The fire chiefs for the ARMY and the COUNTY will maintain copies of all agreements.

IN WITNESS HEREOF, the parties hereto have executed this Agreement this 31st day of August, 1998.

FOR the County of Hawaii:

Mayor, County of Hawaii

FOR the Secretary of the Army:

Commander
United States Army Garrison, Hawaii

RECOMMEND APPROVAL:

Fire Chief, County of Hawaii

Fire Chief
Directorate of Public Works
United States Army Garrison, Hawaii

APPROVED AS TO FORM AND LEGALITY:

Deputy Corporation Counsel

Date: 8-28-98

STATE OF HAWAII)
) ss:
COUNTY OF HAWAII)

On this 31st day of August, 19 98, before me, Myrleen K. Kaloi, the undersigned Notary Public, personally appeared STEPHEN K. YAMASHIRO, to me personally known, who, being by me duly sworn, did say that he is the Mayor of the COUNTY OF HAWAII, a municipal corporation of the State of Hawaii; that the seal affixed to the foregoing instrument is the corporate seal of said COUNTY OF HAWAII; that the foregoing instrument was signed and sealed on behalf of COUNTY OF HAWAII by authority given to said Mayor of the County of Hawaii by Section 5-1.3(g) of the County Charter, County of Hawaii (1991), as amended; and said STEPHEN K. YAMASHIRO acknowledged said instrument to be the free act and deed of said COUNTY OF HAWAII.

Myrleen K. Kaloi
Notary Public, State of Hawaii

My commission expires: 2/16/2001

L.S.

Agreement Number
FB5260-93354-903

MUTUAL AID FIRE FIGHTING AGREEMENT
CITY AND COUNTY OF HONOLULU, HAWAII
UNITED STATES NAVY
NAVAL STATION, PEARL HARBOR, ISLAND OF OAHU
UNITED STATES AIR FORCE
15TH AIR BASE WING (PACIFIC AIR FORCES)

This Mutual Aid Fire Fighting Agreement entered into this 20th day of December 1993 by and between the City and County of Honolulu, Hawaii (hereinafter referred to as the City and County), the United States Navy, Naval Station, Pearl Harbor, island of Oahu (hereinafter referred to as the Navy), and the 15th Air Base Wing (Pacific Air Forces) (hereinafter referred to as the Air Force), each represented by the respective commander executing this instrument, cancels and supersedes a previous agreement of 20 January 1988 and bears witness that:

WHEREAS, Public Law 93-288 and Public Law 46 - 84th Congress approved on 27 May 1955, Chapter 105, Section 1, 69 statute 66, 42 USC Section 1856, a, b, c, d, authorize the execution of mutual aid agreements between agencies of the United States and other agencies and instrumentalities for mutual aid in fire protection; and

WHEREAS, the Armed Forces, Hawaii Fire Fighting Force protects military installations situated at various locations adjacent to civilian communities throughout the island of Oahu; and

WHEREAS, the City and County maintains a fire department to protect the civilian communities situated adjacent to and/or surrounding the aforementioned military installations, which are protected by the Armed Forces, Hawaii Fire Fighting Force; and

WHEREAS, it is recognized that potential conflagration and disaster hazards exist in the various military establishments and civilian communities which are conceivably beyond the abilities of the fire fighting forces supported by either the Armed Forces, Hawaii or the City and County to control individually; and

WHEREAS, The City and County and the Armed Forces, Hawaii, are cognizant of the benefits which will derive from mutual fire fighting assistance;

NOW, THEREFORE, in the interests of the public safety, health and welfare the City and County and the Armed Forces, Hawaii, do mutually agree as follows:

ARTICLE I

POLICY

Section 1. To the end that the several civilian communities and military establishments, island of Oahu, may enjoy optimum fire protection, the City and County and the Armed Forces, Hawaii, when requested and consistent with conditions at the time of the request, will assist each other in the suppression of fire in properties and installations which are normally the concern of the other.

Section 2. Fire fighting matters of mutual interest to the City and County and the Armed Forces, Hawaii, will be coordinated by the Fire Chief of the City and County Fire Department and the Fire Chiefs of the Armed Forces, Hawaii Fire Fighting Force.

Section 3. The Armed Forces, Hawaii and the City and County will retain responsibility for and control of fire prevention and fire fighting matters in their respective installations and properties.

Section 4. Fire fighting operations at military installations and properties will be conducted under the direction of the Officer-in-Charge of the department concerned, except as herein provided by Section 3 of Article V. Fire fighting operations in civilian communities and designated military installations as are set forth in Section 3 of Article V shall be conducted under the direction of the Fire Chief, of the City and County Fire Department or his official assistant.

Section 5. In the event of fire occurring in a civilian community requiring assistance of the Armed Forces, Hawaii Fire Fighting Force, the Fire Chief of military fire companies dispatched or his official assistant will respond and report to the Fire Chief of the City and County Fire Department or his official assistant for the purpose of direction and coordination of the efforts of the Armed Forces, Hawaii Fire Fighting Force with those of the City and County Fire Department.

Section 6. In the event of fire occurring in a military installation requiring assistance of the City and County Fire Department, the Fire Chief or his official assistant will respond and report to the Armed Forces Fire Chief or his official assistant, for the purpose of direction and coordination of the efforts of the City and County fire companies with those of the Armed Forces, Hawaii Fire Fighting Force.

Section 7. The City and County agrees that in order to conform to the requirements of the Department of Defense, relative to release of public information, all requests for information relative to fires at military installations will be referred to the cognizant Public Affairs Officer/Information Officer of the military installation concerned, and that employees, agents or officers of the City and County will refrain from releasing the information.

ARTICLE II

TRAINING

Section 1. The Armed Forces, Hawaii, agrees to permit personnel of the City and County Fire Department to attend fire fighting training classes and/or use its training facilities on a space-available basis without cost to the City and County.

Section 2. The City and County Fire Department agrees to permit personnel of the Armed Forces, Hawaii, to attend fire fighting training classes and/or use its training facilities on a space-available basis and without cost to the Armed Forces, Hawaii.

Section 3. Personnel attending such classes shall be deemed to have assumed such risk as may be normally incident thereto.

Section 4. The Armed Forces, Hawaii, agrees to permit companies of the City and County Fire Department to frequently visit Armed Forces, Hawaii, military installations for the purpose of familiarizing themselves with locations, hazardous areas, water supplies, building construction, alarm systems, and general information needed to enable them to assist efficiently in fire fighting and disaster control operations. All visits will be coordinated with the cognizant Armed Forces Fire Chief or his official assistant.

ARTICLE III

COMMUNICATIONS

Section 1. The Navy maintains a Central Fire Communications Office at Pearl Harbor under the supervision of the Fire Chief, Federal Fire Department, island of Oahu. This office is manned by fire communications operators 24 hours a day. The Navy provides and maintains direct line telephone service and radio communication between the Central Fire Communications Office, Pearl Harbor, Hickam Fire Department Communications Center, and the City and County Fire Alarm Bureau.

Section 2. The City and County and the Navy agree to exchange radio equipment on a loan basis to the end that two-way radio communications can be maintained between the Central Fire Communications Office, Pearl Harbor, and the City and County Fire Alarm Bureau. The Armed Forces, Hawaii, agrees that a common radio frequency will be maintained and utilized for the sole use of the Armed Forces, Hawaii Fire Fighting Force.

ARTICLE IV

COORDINATION OF FIRE ALARM RESPONSE

Section 1. The Armed Forces, Hawaii, agrees that the fire communication operators of the Central Fire Communications Office, Pearl Harbor, may request the fire apparatus of the Armed Forces, Hawaii Fire Fighting Force on the island of Oahu to assist the City and County Fire Department, or any Armed Forces, Hawaii Fire Department, without prior reference to the Commanding Officer of the installation from which the fire apparatus is dispatched. In addition, the Armed Forces, Hawaii, agrees that in the event that military personnel and equipment are needed to assist in combatting large brush or forest fires that are beyond the capability of fire fighting personnel, military personnel and equipment will be dispatched by order of the military command that will be requested to assist, by the Central Fire Communications Office, to the extent military personnel and equipment are available or the situation requires. The Fire Chief of either party may claim reimbursement for the direct expense and losses which are additional firefighting costs above the normal operating costs incurred while fighting a fire under this agreement as provided under 15 USC 2210. Upon the filing of a claim for reimbursement by either party, the Fire Chief or his designee of the appropriate department shall notify the Fire Chief of the responsible department the amount of the claim. Each Fire Chief shall in turn notify their respective local Accounting and Finance Office.

Section 2. The Armed Forces, Hawaii, agrees that in the event fire fighting assistance of the City and County Fire Department is needed by an Armed Forces, Hawaii, Fire Department, requests for such should be channeled through the Central Fire Communications Office, Pearl Harbor.

ARTICLE V

PROVISIONS OF RESPONSE TO ALARMS OF FIRE OR EMERGENCIES

Section 1. The City and County agrees to provide fire apparatus and personnel to alarms of fire, rescue, and emergencies originating in military installations when so requested by the Central Fire Communications Office, Pearl Harbor, insofar as prerequisites of service will permit.

Section 2. The Armed Forces, Hawaii, agrees to provide fire alarm response to civilian communities where military fire departments are the nearest source of fire apparatus when so requested by the City and County Fire Alarm Bureau insofar as prerequisites of service will permit.

Section 3. The City and County agrees to provide fire fighting services to the Army installations at Fort DeRussy; Dillingham Field; Fort Ruger; Kapalama Military Reservation; Waianae Military Reservation; Fort Armstrong (including Army Recruiting Main Station); National Memorial Cemetery of the Pacific; Black Point Army Housing Area, Kahala; installations of the Navy at the old Navy Station, Honolulu; Naval Communication Station Honolulu (inactive) at Haiku; Opana Communication Installation at the north end of the island of Oahu; and installations of the Air Force at Bellows Air Force Station, Waimanalo; Punamano Air Force Station, Kahuku; Kaena Point Satellite Tracking Station; 169th Aircraft Control and Warning Squadron, Mount Kaala; Hickam Petroleum Products Storage Facility (located at Waikakalaua and Kipapa) and Makua Sub Cable; Palehua AF Solar Observatory Research Site, US Coast Guard Base, Sand Island. Such services shall include provisions of first alarm as well as multiple-alarm response, in accordance with a predetermined assignment. The Fire Chief of the City and County Fire Department, or his official assistant, will be in charge of all fire fighting operations at the aforementioned installations. All equipment used in carrying out this agreement will, at the time of action, hereunder, be owned by the City and County Fire Department; and all personnel acting for the City and County Fire Department under this agreement will, at the time of action be an employee or volunteer of the City and County Fire Department.

Section 4. Except as provided in Article IV, Section 1, of this agreement, each party waives all claims against every other party for compensation for any loss, damage, personal injury or death occurring as a consequence of the performance of this agreement.

ARTICLE VI

RESPONSIBILITY OF OPERATIONS

Section 1. In the event of a crash of aircraft owned or operated by the United States or any foreign nation, Armed Forces, Hawaii, may assert their right to establish a NATIONAL DEFENSE AREA, such assertion would not subject civilian resources to military command.

Section 2. The Fire Chiefs of the fire departments of the parties to this agreement are authorized and directed to meet and draft any detailed plans and procedures of operation necessary to effectively implement this agreement, consistent with recognized practices and applicable directives and guidelines of all parties to the agreement. Such plans and procedures of operations shall become effective upon ratification by the signatory parties of this agreement.

ARTICLE VII

OPERATION OF MOBILE FIRE EQUIPMENT

Section 1. Fire Apparatus of the Armed Forces, Hawaii Fire Fighting Force will at all times be operated as emergency status in accordance with pertinent directives of the Department of Defense.

ARTICLE VIII

REVIEW/TERMINATION OF AGREEMENT

This agreement shall become effective upon the date thereof and shall remain in full force and effect until cancelled by mutual agreement of all parties hereto or by written notice by one party (City and County of Honolulu) to the other party (Armed Forces, Hawaii), giving thirty (30) days' notice of said cancellation. The agreement may be reviewed at any point in time, but no less than once every three years by all parties.

IN WITNESS WHEREOF, the parties have executed this agreement in quadruplicate as of the day, month and year hereinabove first written.

APPROVED AS TO FORM AND LEGALITY

Deputy Corporation Counsel
City and County of Honolulu
Honolulu, Hawaii

CITY AND COUNTY OF HONOLULU

12/20/93

Mayor
City and County of Honolulu, Hawaii

UNITED STATES NAVY

6 Dec 93

COMMANDER
Naval Base, Pearl Harbor, Hawaii

UNITED STATES AIR FORCE

19 OCT 1993

COMMANDER
15th Air Base Wing (Pacific Air Forces)
Hickam Air Force Base, Hawaii

DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY SUPPORT COMMAND, HAWAII
DUNNING HALL
FORT SHAFTER, HAWAII 96858-6000

REPLY TO
ATTENTION OF

MEMORANDUM OF AGREEMENT
BETWEEN
THE U.S. ARMY AND THE NATIONAL PARK SERVICE

SUBJECT: Firefighting Support of the National Park Service, Hawaii Volcanoes National Park

This agreement, entered into this 3rd day of February 1988 between the Secretary of the Army acting according to the authority of Section 1856a, Title 42 United States Code and The National Park Service, Hawaii Volcanoes National Park is to secure for each the benefits of mutual aid in fire prevention, the protection of life and property from fire, and firefighting.

1. Article I - Background and Objectives.

WITNESS THAT

WHEREAS, Public Law 93-498 purports to reduce losses of life and property through better fire protection and control, and Public Law 93-288 provides for military assistance to civil authorities under imminent serious conditions and in emergencies and major disasters to include fires, and Public Law 84-46 authorizes the execution of agreements between agencies and instrumentalities of the United States for mutual aid in fire protection of adjacent/nearby areas; and

WHEREAS, the United States Army hereinafter referred to as the ARMY has the authority and jurisdiction to maintain a firefighting force to protect Pohakuloa Training Area and Kilauea Military Camp situated on the Island of Hawaii, in the vicinity of the NATIONAL PARK SERVICE, Hawaii Volcanoes National Park; and

WHEREAS, both the NATIONAL PARK SERVICE and the ARMY have the personnel, equipment and with cross training, the skills suited to the task of managing wildland fire incidents that arise within Hawaii Volcanoes National Park; and

WHEREAS, by pooling the resources of the NATIONAL PARK SERVICE and the ARMY in mutual assistance, the combined strength and efforts of these two agencies would afford the people and resources of the area extensive and effective wildland fire protection as well as a safer working situation for officers of both agencies.

2. Article II - Statements of Work.

NOW, THEREFORE, in consideration of the mutual covenants hereinafter set forth in this document and its various appendices, the NATIONAL PARK SERVICE and the ARMY do agree as follows:

(1) In that each of the adjacent/nearby areas referred to above may enjoy optimum fire protection, the ARMY and the NATIONAL PARK SERVICE when requested by one another and consistent with conditions at the time of the request, will assist each other in the suppression of fires on properties which are normally the concern of the other, each responding agency shall assist the requesting agency with whatever personnel and equipment it may have available at the time; however, in no instance shall the responding agency be under a duty to assist the requesting agency when the personnel and equipment available to it are, or would thereby be rendered insufficient to meet the actual or realistic potential needs of the area served by the agency.

(2) The ARMY agrees that in the event firefighting assistance of the NATIONAL PARK SERVICE is needed, request for such assistance will be placed with the Superintendent or the Chief Ranger of the NATIONAL PARK SERVICE. The NATIONAL PARK SERVICE agrees that in the event firefighting assistance of the ARMY is needed, request for such assistance will be placed with the Commanding Officer of the ARMY installation from which the assistance is requested.

(3) Firefighting operations at Pohakuloa Training Area, shall be conducted under the direction of the responsible ARMY fire chief or his/her assistant; in the case of Kilauea Military Camp all firefighting operations occurring within Department of Defense owned structures will be under the direction of the responsible ARMY fire chief; and in the Hawaii Volcanoes National Park, under the direction of the fire chief of the NATIONAL PARK SERVICE fire service or his/her assistant and includes those fires which may originate within the Kilauea Military Camp.

(4) In deference to the requirements of the Department of Defense relative to the release of public information, all requests for information concerning fires at military installations will be referred to the ARMY commander of the Pohakuloa Training Area for coordination of the response with the ARMY public affairs officer. Employees, agents, or officers of the NATIONAL PARK SERVICE will refrain from releasing such information to the communications media. The ARMY, likewise, will not comment on fires in the Hawaii Volcanoes National Park but will refer the

communications media to the NATIONAL PARK SERVICE information officer.

(5) The NATIONAL PARK SERVICE and ARMY each agrees to permit personnel of either agency to attend each agencies firefighting training classes and/or use training facilities on a space available basis and without cost to the respective agency.

(6) The ARMY agrees to permit fire companies of the NATIONAL PARK SERVICE fire service to visit the ARMY installations for the purpose of familiarizing themselves with locations, hazardous areas, water supplies, building construction, alarm systems, and general information needed to enable them to assist efficiently in firefighting and disaster control operations. All visits will be escorted by the ARMY installation fire chief or his/her assistant.

(7) The NATIONAL PARK SERVICE and the ARMY agree to provide direct line telephone service and radio communication between the NATIONAL PARK SERVICE fire service and the ARMY firefighting force, by permitting the use of their respective emergency communication frequencies, using among others the NATIONAL PARK SERVICE emergency net (168.550/169.400). The ARMY agrees to permit the NATIONAL PARK SERVICE to enter the base command communications net (173.5125) to contact the military commander regarding any of the situations in sections 3 thru 5 of Article II; also, to enter the same net as well as the tenant unit communications net (38.30) when assisting the ARMY firefighting force in combatting a fire at the Pohakuloa Training Area.

(8) The NATIONAL PARK SERVICE and the ARMY each agree to waive all claims against the other for any loss, damage, personal injury, or death occurring in consequence of this Agreement, except those claims authorized under 15 U.S. Code 2210 provided, however, that either agency may bring action against the other, as provided for by law, for the recovery of any damages, losses or injuries suffered by its personnel or equipment due to the tortuous misconduct of the other, and that each agency shall be held separately liable to all third parties who may have a legal or equitable claim against the agency arising out of its tortuous misconduct while engaged in the performance of its duties.

(9) If a crash of aircraft owned or operated by the United States*or military aircraft of any foreign nation occurs within the area for which the Hawaii Volcanoes National Park normally provides fire protection, the Chief of the Army's responding firefighting force or his or her representative may assume full command of firefighting operations on arrival at the scene of the crash.

*Aircraft owned or operated by United States Military.

APZV-PT
SUBJECT: Firefighting Support of the National Park Service, Hawaii Volcanoes National Park

3. Article III - Term of Agreement. Subject to the limitations of NPS-20, the Agreement will run for five years at which time it will be subject to review, modification and reimplementation. The ARMY commander of the Pohakuloa Training Area and the fire chiefs of the NATIONAL PARK SERVICE fire service and the ARMY fire-fighting force are authorized and directed to meet and draft any detailed plans and procedures of operation necessary to effectively implement this Agreement, consistent with recognized practices and applicable directives and guidelines of the NATIONAL PARK SERVICE and the ARMY.

4. Article IV - Key Officials. The NATIONAL PARK SERVICE, in particular, Hawaii Volcanoes National Park Protection Division and the United States ARMY.

5. Article V - Reimbursement. Reimbursement for costs of fire-fighting on federal property will be in accordance with the provisions of Title 15, U.S. Code Section 2210.

6. Article VI - Reports. Reporting for each agency will be according to each agency's respective case incident and reporting system/procedure necessary to document cooperative activities and the natural reporting process of documenting circumstances of a specific event.

7. Article VII - Administrative Provisions. No administrative provisions.

8. Article VIII - Termination. IN WITNESS THEREOF, the parties ~~hereto~~ have caused this Agreement to be effective from the date of execution and will continue in force for a period of 5 years unless terminated by either party by sixty (60) days' written notice to the other; provided, however, that all of the provisions herein are complied with.

FOR THE SECRETARY OF THE ARMY:

Harold V. Floody Jr.
HAROLD V. FLOODY, JR.
Colonel, U.S. Army
Commander
U.S. Army Support Command, Hawaii

13 August 1987
(Date)

James F. Martin
JAMES F. MARTIN
Acting Superintendent
Hawaii Volcanoes National Park

February 3, 1988
(Date)

FEB 09 '98 05:09PM DPW FIN MGT DIV P.4

MUTUAL AID FIREFIGHTING AGREEMENT

DIVISION OF FORESTRY AND WILDLIFE

UNITED STATES ARMY SUPPORT COMMAND, HAWAII

This Mutual Aid Firefighting Agreement entered into this 8th day of November, 19 85, by and between the STATE OF HAWAII, DEPARTMENT OF LAND AND NATURAL RESOURCES, DIVISION OF FORESTRY AND WILDLIFE, hereinafter referred to as the "Division of Forestry and Wildlife," and the UNITED STATES ARMY SUPPORT COMMAND, HAWAII, hereinafter referred to as the "Army."

WITNESSETH THAT:

WHEREAS, PUBLIC LAW 46 - 84th Congress approved 27 May 1955 c. 105 S 1, 69 stat. 66, 42 USC SS 1856 a, b, c, d, authorizes the execution of mutual aid agreements between agencies of the United States and other agencies and instrumentalities for mutual aid in the fire protection; and

WHEREAS, the Division of Forestry and Wildlife, pursuant to Chapter 185, Hawaii Revised Statutes, is responsible for taking measures for the prevention, control and extinguishment of forest fires on State-owned and private lands within the forest reserves and public shooting grounds of the State and to cooperate with established fire control agencies of the counties and the Federal

[illegible]
[illegible] Hawaii
11/22/85

government in developing plans and programs and mutual aid agreements for assistance for the prevention, control and extinguishment of fires on forest, pasture, and brush lands not within forest reserves; and

WHEREAS, both the Army and the Division of Forestry and Wildlife have the personnel, equipment and skills suited for the task of dealing with the fire hazard operations on the Island of Hawaii; and

WHEREAS, by pooling the resources of the Army and the Division of Forestry and Wildlife, the combined strength and efforts of these two agencies would afford the people of the area more extensive and effective protection of their lives and property,

NOW, THEREFORE, in consideration of the above and the mutual covenants hereinafter set forth, the Army and the Division of Forestry and Wildlife do hereby agree as follows:

(1) That the word "agency" when used in the Agreement shall mean either the Army or the Division of Forestry and Wildlife;

(2) That either agency may, when it deems it necessary, request the assistance of the other agency when dealing with problems of fire prevention, detection, suppression and extinguishment operations which occur on the Island of Hawaii; and upon receipt of such request, or upon its own initiative, the other agency shall assist the requesting agency with whatever personnel and equipment it may have available at the time; provided, however,

in no instance shall the responding agency be under a duty to assist the requesting agency when the personnel and equipment available to it are, or would thereby be rendered insufficient to meet the actual or realistically potential needs of the community or area served by the agency;

(3) That neither agency will make any direct charges to the other for fire suppression expenses incurred when such assistance is rendered, except as provided for in item (4);

(4) That each agency shall remain responsible for all losses, damages or injuries to its own personnel and equipment which are incurred while engaged in any mutual undertakings; provided, however, that either agency may bring action against the other, as provided for by law, for the recovery of any damages, losses or injuries suffered by its personnel or equipment due to the tortuous misconduct of the other, including, but not limited to, claims for reimbursement for damages to, and for expenses incurred in fighting a fire upon or threatening the agency's land and its resources when the fire originated upon the other agency's land.

(5) That each agency shall be separately liable to all third parties who may have a legal or equitable claim against the agency arising out of its tortuous misconduct while engaged in the performance of its duties;

(6) That administrative personnel of both agencies shall meet to formulate a plan of cooperation dealing with the procedures to implement the purposes of this Agreement;

(7) That each agency will retain its primary responsibility for the control of fire prevention and firefighting matters in its respective installations and properties;

(8) That each agency agrees that, in order to conform to the requirements of the UNITED STATES DEPARTMENT OF DEFENSE relative to release of public information, all requests for information relative to fires at military installations will be referred to the cognizant COMMANDING OFFICER of the military installation concerned, and that employees, agents or officers of the agencies shall refrain from releasing such information;

(9) That each agency agrees to permit personnel of the other to attend firefighting training classes and/or use its training facilities on a space-available basis and without cost to the agency; and

(10) That each agency agrees to permit companies of the other to visit one another's installations and properties for the purpose of familiarization with locations, hazardous area, water supplies, building construction, alarm systems and general information necessary to promote the efficient assistance in firefighting and disaster control operations. On Military installations, all visits will be escorted by the cognizant Army Fire Chief or his official assistant.

IT IS UNDERSTOOD that nothing contained herein shall diminish or abridge those rights possessed by the Division of Forestry and Wildlife in enforcing the provisions contained in General Lease No. S-3849 (U.S. Lease, Contract No. OA-94-626-ENG-80) dated August 17, 1964 made by the State of Hawaii as lessor and United States of America as lessee, covering certain public lands situated at Kaohe, Hamakua and Puuanahulu, North Kona, Island of Hawaii, Hawaii, a copy of the general lease is on file with the Department of Land and Natural Resources.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be effective from the date of execution and will continue in force unless terminated by either party by thirty (30) days' written notice to the other; provided, however, that all of the provisions herein are complied with.

STATE OF HAWAII
DEPARTMENT OF LAND AND
NATURAL RESOURCES
DIVISION OF FORESTRY
AND WILDLIFE

By _____
Chairman and Member
Board of Land and Natural
Resources

And By _____
Member, Board of Land and
Natural Resources

UNITED STATES ARMY SUPPORT
COMMAND, HAWAII

By _____
Its Commander

APPROVED AS TO FORM:

_____
Deputy Attorney General

October 1, 1985
Date

Appendix 3

Wildland Fire
Program Budget

25TH ID(L) & USARHAW WILDFIRE MANAGEMENT PROGRAM
FY03 - FY09 Projected Sustainment Budget

	FY03	FY04	FY05	FY06	FY07	FY08	FY09
Civilian Pay (Wildland Fire Program Manager/PTA Wildland Fire Cooridnator)	0	90	150	155	160	170	175
Ten Person Stike Team	0	0	700*	700*	700*	700*	700*
Aviation Assets (2 helicopters) Lease	0	0	3600*	3600*	3600*	3600*	3600*
Helicopter Maintenance	0	0	800*	800*	800*	800*	800*
4 Pilots/2 Crewchiefs (4 total)	0	0	540*	540*	540*	540*	540*
Travel	0	12	15	15	18	20	20
NWCG Wildfire Training/Conferences	40	42	44	45	45	45	45
Annual RAWS Maintenance	24	27	30	32	35	35	35
Wildland Fire Equipment	40	20	25	25	25	25	25
Wildland Fire Vehicle Maintenance/Repair	25	25	30	30	30	30	30
Prescribed Fire	121	60	60	45	45	45	45
Fire Bucket Maintenance/Repair	20	25	25	28	30	30	30
Firebreak/Fire Access Road Maintenance	70	75	75	75	75	75	75
Wildfire Emergency Service Contracts (PTA)	75	75	75	75	75	75	75
Vegetation Control (MMR)	330	345	250	225	200	200	210
Procure New RAWS Units	75	50	25	28	0	0	0
Aerial Herbicide/Prescribed Fire/UXO Clearance Projects (SBCT)	123	60	100	0	100	0	100
Procure/Replace Bambi Fire Buckets	26	30	0	30	0	45	0
Develop/Revalidate Fire Danger Rating System (CEMML)	0	0	25	0	0	0	15
Review/Update Integrated Wildland Fire Management Plan/SOP	0	0	25	0	20	0	15
GIS Mapping-Fire History & Trend Analysis	0	45	0	0	0	0	50
ADP Equipment/Software Program Development	0	25	5	2	0	0	15
Procure/Replace Wildland Fire Vehicles^	0	150	180	200	60	65	70
GSA Vehicle Lease	0	8	8	10	12	12	13
Repair/Maintain Firebreaks (ITAM)	0	0	70	110	120	130	130
Fuel Modification/Vegetation Control	0	0	75	75	80	70	60
ESTIMATED ANNUAL TOTAL	**969**	**1164**	**6932**	**6845**	**6770**	**6712**	**6873**

Notes: Unresourced Requirements (URR's)
Wildfire Management Program funded FY05-09 POM
ITAM Program Funded
^Fire Vehicle Procurement/Replacement program identified in DA 1577 funded with OPA funds.
*Rough estimate. Cost determination for the 10 person strike team and helicopter lease are in progress.

Additional funding for site specific projects such as firebreak construction and RAWS purchases are listed by installation in Chapter 7.

25th ID(L) & USARHAW WILDLAND FIRE MANAGEMENT PROJECTS FY03 - FY05

INSTALLATION	PRI	PROJ/FEWR NO.	PROJECT TITLE	EST COST	FUNDED BY	FY
PTA	2	TA100013J	Construct New PTA West Firebreak (Phase II)	500	DPW ENV	O4
	3	TA100023J	Construct New PTA North Fuelbreak (Phase III)	575	DPW ENV	O4
	4	TA100033J	Construct 3 New PTA Dip Tanks	325	DPW ENV	O4
	5	TA100043J	PTA Fuel Management Corridors/Vegetation Control	110	DPW ENV	O4
	6	TA100053J	Grazing/Bio-Control Pilot Study at PTA/MMR	90	DPW ENV	O4
	7	TA100063J	Install New RAWS Unit Keamuku	18	DPW ENV	O5
			Sub Total	**1618**		
MMR	1	MMR 03-01/2	Prescribed Burn Plan 2-Settlement Agreement	155	IFSO	O3
	2	TA100073J	Vegetation Control MMR	330	DPW ENV	O3
	3	TA100083J	Upgrade MMR Water Distribution System	90	DPW	O4
	4	TA100093J	Replace Dip Pond Liners at MMR	60	DPW TCCC	O4
	5	EPR	Makua Implementation Plan (Wildfire Management)	N/A*	DPW ENV	O4
			Sub Total	**635**		
SBMR	1	NA010682J	Construct New SB Dip Pond	60	DPW TCCC	O3
	2	SBMR 03-01	SBCT Prescribed Burn/Aerial Herbicide	245	IFSO	O3
	3	TA100103J	Construct New Firebreak McCarthy Flats	75	DPW TCCC	O4
	4	TA100113J	Upgrade SB Firebreak Fixed RAWS Unit	18	DPW ENV	O4
			Sub Total	**398**		
SRAA	1	TA100123J	Construct New SRAA Firebreak QTR2	125	DPW ENV	O5
	2	TA100133J	Construct New Dip Pond South Range	75	DPW TCCC	O5
	3	TA100143J	Fuel Modification/Vegetation Control South Range	25	DPW ENV	O5
	4	TA100153J	Install New RAWS Unit South Range	18	DPW ENV	O4
			Sub Total	**243**		
SBER	1	TA100163J	Fire Access Road Maintenance SBER	25	DPW TCCC	O4
	2	TA100173J	Fuel Modification/Vegetation Control SBER	15	DPW ENV	O4
			Sub Total	**40**		
KTA	1	TA100183J	Construct New KTA Dip Pond	70	DPW TCCC	O5
		TA100203J	Procure 2 New Fire Vehicles for KTA	150	IFSO	O4
	3	TA100213J	Fire Access Road Maintenance KTA	25	DPW TCCC	O4
			Sub Total	**245**		

KLOA	1	TA100223J	Install New KLOA RAWS Unit (Pu'u Kapu)	18	DPW ENV	O4
		TA100233J	Fuel Modification/Vegetation Control KLOA	30	DPW ENV	O4
			Sub Total	**48**		
DMR	1	TA100243J	Install New DMR RAWS Unit	18	DPW ENV	O4
	2	TA100253J	Rpr/Maint & Extend Interior Firebreak Road	125	DPW/TCCC	O5
	3	TA100263J	Construct New DMR Firebreak	190	DPW ENV	O6
			Sub Total	**333**		
			TOTAL ESTIMATED COST	**3560**		

*Cost for fire management related to the Makua Implementation Plan is considered there.

Appendix 4

List of Acronyms

APPENDIX 4 – LIST OF ACRONYMS

Acronym	Meaning
4WD	Four wheel drive
AAF	Army Air Field
AAR	After-Action Report
ACDR	Area Commander
ACOS	Assistant Chief of Staff
AFB	Air Force Base
AFD	Army Fire Department
AGL	Above Ground Level
ANP	Anaerobic Power
APRT	Army Physical Readiness Test
AR	Army Regulation
ARTEP	Army Training and Evaluation Program
ASE	Aviation Support Element
ATM	Aircrew training manual
BI	Burn Index
BLM	Bureau of Land Management
BN	Battalion
BSA	Biological Sensitive Area
CEMML	Center for Environmental Management of Military Lands
CFR	Code of Federal Regulations
CG	Commanding General
CMD	Commander
CP	Command Post
CPAO	Civilian Personnel Assistance Office
CPX	Command Post Exercise
CRMP	Cultural Resources Management Plan
CRWB	Crew Boss Single Resource
CSU	Colorado State University
DA	Department of Army
DIV	Division
DIVS	Division Group Supervisor
DLNR	Department of Land and Natural Resources
DMR	Dillingham Military Reservation
DOC	Division Operations Center
DOD	Department of Defense
DODI	Department of Defense Instruction
DOFAW	Division of Forestry and Wildlife
DOL	Director of Logistics
DOT	Department of Transportation
DPTM	Directorate of Plans, Training and Mobilization
DPW	Directorate of Public Works

DRM	Director of Resource Management
DTG	Date/Time/Group
EA	Environmental awareness
ECO	Environmental Compliance Officer
EDRES	Emergency Deployment Readiness Exercise
EMP	Ecosystem Management Plan
EOC	Emergency Operations Center
EOD	Explosive Ordinance Disposal
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Air Regulations
FDRS	Fire Danger Rating System
FEMA	Federal Emergency Management Agency
FFD	Federal Fire Department
FFM	Fine Fuel Moisture
FFT1	Firefighter, Type 1
FFT2	Firefighter, Type 2
FI	Non-rated Crew Member Instructor
FM	Field manual
FMA	Fire Management Area
FRP	Federal Response Plan
FY	Fiscal year
G3	Operations, plans, and training staff at Corps and Division
GANDA	Garcia and Associates
GIS	Geographic information system
GOES	Geostationary Operational Environmental Satellite
GPS	Global Positioning System
HE	Hand Grenades
HFD	Honolulu Fire Department
HIARNG	Hawaii Army Reserve National Gaurd
HINHP	Hawaii Natural Heritage Program
HMMWV/HUMMER	High mobility multipurpose wheeled vehicle
HVNP	Hawaii Volcanoes National Park
IA	Initial Attack
IAW	In Accordance With
IC	Incident Commander
ICRMP	Integrated Cultural Resources Management Plan
ICS	Incident Command System
ICT1	Incident Commander, Type 1
ICT2	Incident Commander, Type 2
ICT3	Incident Commander, Type 3
ICT4	Incident Commander, Type 4

ID(L)	Infantry Division (Light)
IFSO	Instillation Fire and Safety Office
INRMP	Integrated Natural Resources Management Plan
IOC	Installation Operations Center
IP	Instructor Pilot
IRIN	Infrared Interpreter
ISA	Interservice Support Agreement
ISO	Installation Safety Office
ITAM	Integrated training area management
IWFMP	Integrated Wildland Fire Management Plan
JSOP	Joint Services Operation Procedure
KLOA	Kawailoa Training Area
KMC	Kilauea Military Camp
KTA	Kahuku Training Area
LCTA	Land Condition Trend Analysis
LITC	Light Infantry Training Command
MAC	Military Airlift Command
MARKS	Modern Army Recordkeeping System
MCBH	Marine Corps Base Hawaii
MMR	Makua Military Reservation
MOS	Military Occupation Skills
MOUT	Military Operations on Urban Terrain
MPRC	Multi Purpose Range Complex
MRE	Meal Ready to Eat
MSCA	Military Support to Civil Authorities
MSL	Mean Sea Level
NATOPS	Naval Aviation Training Operations Standard
NAVSTAPH	Naval Station Pearl Harbor
NCO	Non-Commissioned Officer
NEPA	National Environmental Policy Act
NFDRS	National Fire Danger Rating System
NFFL	Natural Forrest Fire Laboratory
NHPA	National Historic Preservation Act
NIFC	National Interagency Fire Center
NLT	No Later Than
NOE	Nap of the Earth
NPS	National Park Service
NRHP	National Register of Historic Places
NVG	Night Vision Goggles
NWCG	National Wildfire Coordinating Group
OAS	Office of Aircraft Services
OGE	Out of Ground Effect

OIC	Officer in Charge
OIT	Officer in Training
OSC1	Operations Section Chief, Type 1
OSC2	Operations Section Chief, Type 2
PAO	Public Affairs Officer
PCT	Plant Community Types
PFC	Private First Class
PIC	Pilot In Command
POC	Point Of Contact
PPE	Personal Protective Equipment
PTA	Pahakuloa Training Area
PTB	Position Task Books
QTR2	Qualifying Training Range
RAWS	Remote Area Weather Station
RDH	Range Division Hawaii
RH	Relative Humidity
RSO	Range Safety Officer
RTLP	Range and Training Land Program
SB	Schofield Barracks (Military Reservation)
SBCT	Stryker Brigade Combat Training
SBER	Schofield Barracks East Range
SBMR	Schofield Barracks Military Reservation
SEA	Sensitive Ecological Area
SFO	Senior Fire Officer
SHPO	State of Hawaii Preservation Office
SI	Non-rated Crew Member Standardization Instructor
SJA	Staff Judge Advocate
SOP	Standing Operating Procedure
SP	Standardization Pilot
SRAA	South Range Acquisition Area
SRTA	Short Range Training Ammunition
STCR	Strike Team Leader Crew
STDL	Strike Team Leader
STPL	Strike Team Leader Tractor/Plow
TC	Training circular
TCCC	Troop Construction Coordination Committee
TFLD	Task Force Leader
TNSP	Training Specialist
TOW	Tube Launched Optical Weapon System
TRPB	Tractor/Plow Boss
UH	University of Hawaii
USACE	U.S. Army Engineering Support Center

USAF	U.S. Air Force
USAGHI	U.S. Army Garrison, Hawaii
USARHAW	U.S. Army Hawaii
USARPAC	U.S. Army Pacific
USCG	U.S. Coast Guard
USCINCPAC	U.S. Commander in Chief Pacific
USFWS	U.S. Fish and Wildlife Service
USMC	U. S. Marine Corps
UXO	Unexploded ordnance
VFR	Visual Flight Rules
VO2	Volume Oxygen
WFIR	Wildland Fire Incident Report
WP	White phosphorus