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MCTP 12-10C





JUNGLE OPERATIONS

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JUNGLE OPERATIONS

Contents

		Page
	PREFACE	**v**
	INTRODUCTION	**vii**
Chapter 1	**THE JUNGLE ENVIRONMENT**	**1-1**
	Jungle Regions	1-1
	Weather	1-5
	Terrain	1-6
	Wildlife	1-8
	Environmental Effects on Personnel	1-10
	Environmental Effects on Equipment	1-21
Chapter 2	**FOUNDATIONS FOR JUNGLE OPERATIONS**	**2-1**
	Understanding Jungle Operations	2-1
	Operational Framework	2-2
	Multiple Domain Operations in an Extended Jungle Battlefield	2-5
	Joint Operations in a Jungle Environment	2-7
	Fundamentals of Jungle Operations	2-8
Chapter 3	**COMBAT POWER IN JUNGLE REGIONS**	**3-1**
	Combat Power	3-1
	Leadership	3-1
	Information	3-2
	Information Warfighting Function	3-2
	Command and Control Warfighting Function	3-3
	Movement and Maneuver/Maneuver Warfighting Function	3-12
	Intelligence Warfighting Function	3-16
	Fires Warfighting Function	3-20
	Sustainment/Logistics Warfghting Function	3-28
	Protection/Force Protection Warfighting Function	3-34
Chapter 4	**JUNGLE OFFENSIVE OPERATIONS**	**4-1**
	Offensive Operations	4-1
	Characteristics of the Offense	4-2

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Types of Offensive Operations 4-4
Forms of Maneuver 4-7
Warfighting Function Considerations 4-10
Consolidate Gains 4-12

Chapter 5 JUNGLE DEFENSIVE OPERATIONS 5-1
Defensive Operations 5-1
Defensive Characteristics 5-2
Types of Defensive Operations 5-5
Defending Encircled 5-10
Forms of the Defense/Defensive Methods 5-11
Transition 5-16
Warfighting Function Considerations 5-17

Chapter 6 JUNGLE STABILITY OPERATIONS 6-1
Stability Operations 6-1
Stability Operations Tasks 6-2
Transition 6-6
Warfighting Function Considerations 6-6

Chapter 7 TRAINING FOR JUNGLE OPERATIONS 7-1
Training Adapted for Jungle Operations 7-1
Camouflage and Concealment 7-2
Equipment Operator Training 7-2
Survival, Evasion, and Escape 7-2
Water Survival 7-2
Land Navigation 7-3
Equipment Training 7-3
CBRN Training 7-3
Jungle Field Craft 7-3
Medical Training Considerations 7-4
Physical Conditioning and Acclimatization 7-5
Weapons Training 7-5
March Discipline 7-5
Adjustment and Conduct of Fire 7-6
Air Defense 7-6
Fratricide Considerations 7-6

Appendix A NAVIGATION AND TRACKING IN JUNGLE REGIONS A-1

Appendix B NEGOTIATING JUNGLE OBSTACLES B-1

Appendix C INDIVIDUAL COMBAT LOAD IN JUNGLE OPERATIONS C-1

Appendix D TECHNIQUES FOR FRATRICIDE REDUCTION IN THE JUNGLE D-1

Appendix E MARINE CORPS DOCTRINAL SCHEMA CONVERSIONS E-1

SOURCE NOTES ..... Source Notes-1

GLOSSARY Glossary-1

REFERENCES References-1

INDEX Index-1

Figures

Figure 1-1. Jungle and savanna regions of the world 1-1
Figure 1-2. Primary jungle 1-2

Figure 1-3. Secondary jungle 1-3
Figure 1-4. Savanna 1-4
Figure 2-1. Cyberspace in a multiple domain battlefield 2-7
Figure 3-1. Marine air-ground task force 3-7
Figure 3-2. Overcoming jungle communications challenges 3-10
Figure 3-3. Jungle movement technique 3-14
Figure 3-4. Computing the correction in deviation 3-27
Figure 3-5. Computing the correction in range 3-28
Figure 5-1. Y-shaped perimeter defense 5-13
Figure 5-2. Reverse slope defense 5-15
Figure 6-1. Sample jungle SWEAT-MSO lines of effort 6-4
Figure 7-1. Poncho shelters 7-4
Figure A-1. Pace table A-2
Figure A-2. Resection by indirect fire A-3
Figure A-3. Offset method A-4
Figure A-4. Attack point method A-4
Figure B-1. Common knots B-3
Figure B-2. Poncho brush raft B-5
Figure B-3. Australian poncho raft B-6
Figure B-4. Determination of river width B-8
Figure B-5. Swimmer pulling rope across B-8

Tables

Table 1-1. Work/rest and water consumption guide 1-13
Table 6-1. Joint, Army, and Marine Corps stability tasks 6-2
Table A-1. Daylight movement rates A-2
Table A-2. Tracking points A-6
Table E-1. Marine Corps doctrinal manual number conversion E-1

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Preface

ATP 3-90.98/MCTP 12-10C, *Jungle Operations*, is a dual-designated Army and Marine Corps manual that provides Soldiers/Marines with concepts and techniques associated with conducting operations in a jungle environment. This publication supersedes FM 90-5 and MCTP 12-10C, dated August 1982.

The principal audience for ATP 3-90.98/MCTP 12-10C includes Army/Marine Corps commanders, leaders, staffs, and Soldiers/Marines. Trainers and educators throughout the Army/Marine Corps will also use this manual.

Commanders, staffs, and Soldiers/Marines ensure their decisions and actions comply with applicable U.S., international, and, in some cases, host-nation laws and regulations. Commanders at all levels ensure their Soldiers/Marines operate in accordance with the law of war and the rules of engagement. See FM 6-27/MCTP 11-10C for more information on the law of land warfare.

ATP 3-90.98/MCTP 12-10C denotes Marine Corps-specific text with underlining.

ATP 3-90.98/MCTP 12-10C uses joint terms where applicable. Selected joint, Army, and Marine Corps terms and definitions appear in both the glossary and the text. In doctrinal publications, the normal convention for identifying terms uses italics. Since this is a dual-designated Army and Marine Corps manual, the following protocol is used to distinguish proponency (authority) of information and terms:

- Terms in italics and phrasing both underlined—Marine Corps specific terms, phrasing, or concepts.
- Terms in italics and definitions in plain text—joint and Army terms with proponent publication in parentheses.

ATP 3-90.98/MCTP 12-10C implements standardization agreement (known as STANAG) Allied Tactical Publication-3.2.1B.

ATP 3-90.98/MCTP 12-10C uses the current USMC doctrinal numbering schema for reference. Appendix D contains a cross reference table between the current and historical USMC doctrine numbers as many Army multi-service publications do not currently reflect the current USMC doctrine numbering schema.

ATP 3-90.98/MCTP 12-10C applies to Active Army, the Army National Guard/Army National Guard of the United States, United States Army Reserve, and Marine Corps, and United States Marine Corps Reserve unless otherwise stated.

The proponent of ATP 3-90.98/MCTP 12-10C is the United States Army Combined Arms Center. The preparing agency is the Combined Arms Doctrine Directorate, United States Army Combined Arms Center. Send comments and recommendations on a DA Form 2028 (*Recommended Changes to Publications and Blank Forms*) to Commander, U.S. Army Combined Arms Center, ATTN: ATZL-MCD (ATP 3-90.98), 300 McPherson Avenue, Fort Leavenworth, KS 66027-1300; by email to usarmy.leavenworth.mccoe.mbx.cadd-org-mailbox@mail.mil; or submit an electronic DA Form 2028.

U.S. Marine Corps readers of this publication are encouraged to submit suggestions and changes to Doctrine Control Branch via e-mail: doctrine@usmc.mil.

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Introduction

To understand ATP 3-90.98/MCTP 12-10C, Army professionals must understand the doctrinal fundamentals contained in ADP 3-0 and ADP 3-90. Army professionals should understand the operations and procedures contained in FM 3-0. Army leaders and Soldiers should understand the operations process (plan, prepare, execute, and assess) and how that process relates to the Army's military decision-making process and troop leading procedures as described in ADP 5-0. Marines Corps leaders and Marines must understand the doctrinal fundamentals in MCDP 1 and MCDP 1-0, as well as the Marine Corps planning process in MCWP 5-10 (MCWP 5-1). Both leaders and Soldiers/Marines should understand the intelligence preparation of the battlefield/battlespace process found in ATP 2-01.3 and MCRP 2-10B.1 (MCRP 2-3A).

The techniques contained in this publication are based on the Army's and Marine Corps' historical lessons learned in previous operations conducted in jungle environments. ATP 3-90.98/MCTP 12-10C replaces previous editions of FM 90-5, *Jungle Operations*, and MCTP 12-10C, *Jungle Operations*. This publication updates and reorganizes the information contained in the 1982 versions of FM 90-5 and MCTP 12-10C as well as reflects changes in Army and *Marine Corps* capstone doctrine.

Several changes occurred in the organization and content of this publication when compared with its predecessor, the 1982 edition of FM 90-5, *Jungle Operations*, and MCTP 12-10C, *Jungle Operations*. The seven chapters of this current ATP 3-90.98/MCTP 12-10C define jungle environments, describe the foundations of jungle operations, examine combat power in jungle regions, present methods and techniques for jungle offensive and defensive operations, outline stability operations in the jungle, and offer training for jungle operations:

- Chapter 1 defines the various types of jungle regions. Chapter 1 also describes the effects of the jungle environment on personnel and equipment.
- Chapter 2 provides the foundations for jungle operations.
- Chapter 3 examines how the jungle affects combat power.
- Chapter 4 describes jungle offensive operations and the environmental impacts by warfighting function.
- Chapter 5 examines jungle defensive operations and the environmental impacts of the jungle by warfighting function.
- Chapter 6 reviews jungle stability operations and the environmental impacts of the jungle by warfighting function.
- Chapter 7 offers training considerations for jungle operations.

The techniques and considerations discussed in this publication only illustrate a way to conduct operations in the jungle. Collectively they provide a set of tools that leaders and Soldiers/Marines employ according to the unique tactical or operational situation that they face at any given time and location.

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Chapter 1

The Jungle Environment

This chapter examines jungle regions found throughout the world and their environmental impact on personnel and equipment. Jungles are harsh environments, characterized by intense heat, heavy precipitation, and thick vegetation that can adversely impact operations for unprepared forces. Restrictive terrain can limit mobility and observation while excessive heat and humidity can fatigue troops and degrade equipment. However, through preparation, acclimatization, and preventive measures, Soldiers/Marines can overcome these challenges and prevail in the dense forests, swamps, and grasslands of the world's jungles.

JUNGLE REGIONS

1-1. Jungles are masses of tropical vegetation that are often tangled, overgrown, and impenetrable. Successful jungle operations require modifications to equipment and tactics as the environment can profoundly affect military operations. Primary, secondary, and savanna are the three main classifications of jungles. Primary and secondary jungles can be further classified as tropical or deciduous based upon the predominate trees. Common land features in the jungle are swamps, savannas, and cultivated areas. The large amounts of annual precipitation support incredible plant and wildlife density and diversity as well as make jungles the most ecologically rich and vibrant environments on the planet. They occur most commonly in the tropical areas of the world, mainly Southeast Asia, Africa, and Latin America. (See figure 1-1 for locations of the major jungles.)

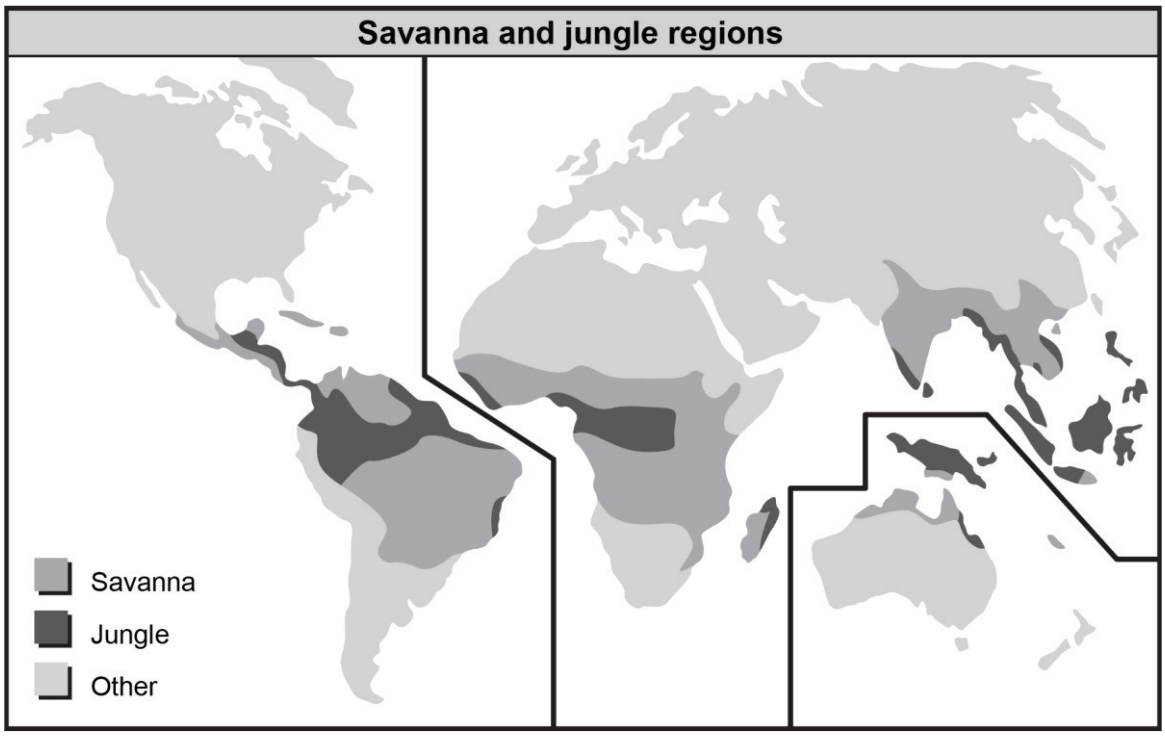


Figure 1-1. Jungle and savanna regions of the world

1-2. Jungle climates vary with location. Close to the equator, all seasons are nearly alike, with rains throughout the year; farther from the equator, especially in India and Southwest Asia, jungles have distinct wet (monsoon) and dry seasons. Both zones have high temperatures (averaging 78 to 95+ degrees Fahrenheit [26 to 35 degrees Celsius]), heavy rainfall (as much as 394 inches [1,000 centimeters] annually), and high humidity (90 percent) throughout the year.

JUNGLE TYPES

1-3. Jungles generally consist of dense forests, grasslands, cultivated areas, and swamps; however, the degree to which these features are present is used to classify the jungle by type. Jungles are classified as either primary jungles, secondary jungles, or savanna based on the terrain and vegetation.

Primary Jungles

1-4. Depending on the type of trees growing in the forests, primary jungles are classified either as tropical rain forests or as deciduous forests. Unlike secondary jungles or savannas, primary jungles consist largely of old growth trees undisturbed by logging, farming, or other human activities. Primary jungles have tall trees that form a dense canopy. As such, little light penetrates to the jungle floor and undergrowth may be relatively thin. Secondary jungles exist in areas that have been previously cleared for farming or logging and are characterized by younger, shorter trees and thicker undergrowth. Savannas are natural grasslands and the few trees present are often grouped together in small groves or thickets. Figure 1-2 illustrates a primary jungle.



Figure 1-2. Primary jungle

Tropical Rain Forests

1-5. Tropical rain forests consist mostly of large trees whose branches spread and lock together to form canopies. These canopies, which can exist at two or three different levels, may form as low as 32 feet (10 meters) from the ground. The canopies prevent sunlight from reaching the ground, causing a lack of undergrowth on the jungle floor. Extensive above-ground root systems and hanging vines are common. These conditions, combined with a wet and soggy surface, make vehicular traffic difficult. Foot movement is easier in tropical rain forests than in other types of jungle. Except where felled trees create a gap in the canopy of the rain forest, observation from the air is nearly impossible. Ground observation is generally limited to 164 feet (50 meters) or less.

Deciduous Forests

1-6. Deciduous forests are found in subtropical zones where both wet and dry seasons exist. These jungles generally grow between the Tropic of Cancer and the Tropic of Capricorn. In the wet season, trees are fully leaved; in the dry season, some of the foliage dies. Trees generally grow less densely in deciduous forests than in rain forests. This thinner canopy allows more rain and sunlight to filter to the ground, producing thick undergrowth. The thick undergrowth of deciduous jungles has a tendency to canalize foot movement due to the deliberate efforts required to break new trail. In the wet season with the trees in full leaf, observation both from the air and on the ground is severely limited; the full leaves impact human observation, optics, and detection from aviation assets.

Secondary Jungles

1-7. Secondary jungles grow predominantly at the edge of tropical rain forests and deciduous forests and in areas where jungles have been cleared and abandoned. Secondary jungles appear when the ground has been repeatedly exposed to sunlight. These areas typically display heavy overgrowth with weeds, grasses, thorns, ferns, canes, and shrubs. Foot movement is extremely slow and difficult. Vegetation may reach to a height of 6 feet (2 meters) which severely limits observation. See figure 1-3 for an example of a secondary jungle.



Figure 1-3. Secondary jungle

Savanna

1-8. Savannas are generally located away from the equator but within the tropics. Savannas consist of broad, open grasslands with few trees. The thick grass has broad-blades and grows 3 to 16 feet (1 to 5 meters) high.

Movement in the savanna is generally easier than in other types of jungle areas, especially for vehicles. However, the sharp-edged, dense grass and extreme heat make foot movement a slow and tiring process. Ground visibility varies depending on the height of the savanna grass. Concealment from air observation is poor for both troops and vehicles. See figure 1-4 for an example of a savanna.



Figure 1-4. Savanna

JUNGLE FEATURES

1-9. Common jungle features include swamps, rivers, bamboo forests, and cultivated areas.

Swamps

1-10. Swamps are forested wetlands. Common to all low jungle areas, swamps have lots of water and poor drainage. Swamps will affect logistical considerations in littoral operations. There are two basic types of swamps-mangrove and palm.

Mangrove Swamps

1-11. Mangrove swamps grow along coastal areas wherever tides influence water flow. The mangrove is a shrub-like tree, which grows 3 to 16 feet (1 to 5 meters) high. These trees have tangled root systems, both above and below the water level, which restrict movement to foot or small boats. Observation in mangrove swamps—both on the ground and from the air—is poor. Concealment is excellent.

Palm Swamps

1-12. Palm swamps exist in both salt and freshwater areas. Like movement in the mangrove swamps, movement through palm swamps is mostly restricted to foot (sometimes small boats). Vehicular traffic is nearly impossible except after extensive road construction by engineers. Observation and fields of fire are very limited. Concealment from both air and ground observation is excellent.

Bamboo

1-13. Bamboo grows in clumps of varying heights in jungles throughout the tropics. Large stands of bamboo are excellent obstacles for wheeled or tracked vehicles. Troop movement on foot through bamboo is slow, exhausting, and noisy. Troops should bypass bamboo stands if possible.

Cultivated Areas

1-14. Cultivated areas exist throughout the tropics and range from large, well-planned, and well-managed farms and plantations to small tracts cultivated by individual farmers. Rice paddies, plantations, and small farms make up the three general types of cultivated areas.

Rice Paddies

1-15. Rice paddies are flat, flooded fields with muddy and soft bottoms. Farmers control the flooding of the fields with a network of dikes and irrigation ditches and fluctuate flooding with seasonal and agricultural cycles. The variable depth of flood waters directly impacts movement with higher flood waters making movement very restricted. However, travel by vehicle is difficult even when fields are dry. Concealment is poor in rice paddies. Cover is limited to the dikes, and then only from ground fire. Observation and fields of fire are excellent. Foot movement is poor when the fields are wet because troops must wade through water and soft mud that is often 20 inches (1/2 meter) deep. When the fields are dry, foot movement becomes easier. Dikes, about 6 to 10 feet (2 to 3 meters) tall, are the only obstacles.

Plantations

1-16. Plantations are large farms or estates where tree crops, such as rubber and coconut, are grown. They are usually carefully planned and free of undergrowth (like a well-tended park). Movement through plantations is generally easy. Observation along the rows of trees is generally good. Cover and concealment can be found behind the trees, but troops moving down the cultivated rows are exposed.

Small Farms

1-17. Small farms exist throughout the tropics. Farmers often create small farms when they clear secondary jungle to cultivate crops. Movement through these areas may be difficult due to fallen trees and scrub brush. Generally, observation and fields of fire have fewer restrictions in cultivated areas than in uncultivated jungles. However, the cultivation removes much of the natural cover and concealment leaving troops more exposed in these areas.

WEATHER

1-18. Leaders and troops must understand that the jungle environment is neutral; it affects both friendly and enemy troops the same. Leaders and troops should reference ATP 2-01.3 and MCRP 2-10B.1 (MCRP 2-3A) when preparing estimates on the effects of terrain and weather on operations.

1-19. The degree to which troops are trained to live and fight in harsh environments will determine their unit's success or failure. High heat and humidity are key characteristics of most jungles. Humidity compounds the effects of high heat by making it more difficult for Soldiers/Marines to regulate body temperature through sweat evaporation.

1-20. Despite the obvious impact of heat and humidity, Soldiers/Marines must recognize that they will likely be exposed to cold as well. Temperatures in the jungle may drop 10 degrees or more at night. When coupled with high humidity and often rainy conditions, Soldiers/Marines may become quite uncomfortable if not properly prepared. Temperatures below freezing do not occur, but chilly nights are common. In some jungles during the winter months, the nights are cold enough to require a wool blanket or poncho liner for sleeping. At a minimum, Soldiers/Marines should replace wet clothing worn during the day with dry clothing at night.

1-21. Rainfall in many parts of the tropics is much greater than that in most temperate zones. Tropical downpours are usually followed by clear skies, and, in most places, the rains are predictable at certain times

of the day. However, there are areas and times of the year where there is nearly continuous rainfall in many areas of the tropics.

TERRAIN

1-22. Jungle terrain is varied and ranges from nearly flat savanna to impassable mountain ranges. Units preparing to deploy to specific jungle regions should seek detailed information on terrain prevalent in the expected area of operations due to the terrain variations.

1-23. Jungle terrain can canalize operations due to poor cross-country mobility, limited hardened roads and trails, and limited bridges and hardened crossing points. Some areas affect cross-country mobility with poor trafficability due to soft soils, rocky areas, mountains, dense to impenetrable vegetation, marshy areas, streams, and major rivers. Roads are usually scarce, poorly maintained, and primitive. Limited infrastructure reduces hardened crossing points over or through water features.

OBSERVATION AND FIELDS OF FIRE

1-24. Observation and fields of fire are generally restricted in jungles. Steep jungle terrain, extensive and dense vegetation, and intermittent and rapidly changing atmospheric conditions restrict direct-fire weapons well short of their maximum range. The minimum engagement range of weapon systems must be considered when emplacing and employing weapons, especially for wire-guided munitions and delayed fused weapons.

1-25. Even though the landscape appears flat when viewed from above; the terrain under the dense vegetative growth can be undulating with relatively deep streams, river beds, and depressions creating significant dead space. Direct fire weapons must be sited to provide mutual support and cover dead space. Troops cover dead space by utilizing indirect fires paired with sensors or observation posts, or aerial fire assets.

1-26. When units cannot establish manned observation posts from dominant terrain, the only means of observation may be from manned aircraft systems, unmanned aircraft systems (UASs), or electronic sensor. However, dense vegetation and weather conditions can severely limit these platforms and systems.

1-27. UASs should be used in conjunction with other unmanned and manned reconnaissance and surveillance systems in a jungle environment. Successful UAS employment in a jungle requires adequate planning for dense vegetation and other environmental factors. Depending on the platform and mission, planners and operators may have to consider the environmental factors in four separate locations: landing and recovery site, transit route, satellite relay site, and anticipated target location. (See ATP 3-04.64/MCRP 3-20.6 [MCRP 3-42.1A]/NTTP 3-55.14/AFTTP 3-2.64 and MCRP 3-20.5 [MCWP 3-42.1] for details on planning for UASs. For UAS characteristics and employment considerations, refer to ATP 3-04.1, ATP 3-04.64/MCRP 3-20.6 [MCRP 3-42.1A]/NTTP 3-55.14/AFTTP 3-2.64, and MCRP 3-20.5 [MCWP 3-42.1], and all applicable technical manuals.)

1-28. Troops can conduct or enhance observation using electronic devices that utilize discrete bands of the electromagnetic spectrum. Electronically assisted observation includes radar, image intensifiers, and infrared (IR) systems that may be ground based or aerial.

1-29. Radars emit extremely short bursts of electromagnetic radiation, which are then reflected off a target and return as an echo. Several radar modes work in the jungle, including moving target indicator and synthetic aperture radar. Radar cannot positively identify a target, cannot see through buildings or terrain, and is degraded by rain and vegetation. Additionally, radar is an active electromagnetic emitter that can be sensed by threat systems. (See ATP 3-55.6/MCRP 2-10A.4 [MCRP 2-24A]/NTTP 3-55.13/AFTTP 3-2.2 for additional information regarding aerial radar operations.)

1-30. Image intensifiers, such as night vision devices (NVDs), work by amplifying visible light and the IR spectrum closest to the frequencies of visible light to create a digital picture. NVDs are passive unless paired with an illuminator for active use. Passive NVDs can operate effectively in jungle environments when ambient visible light exists. However, cloud cover, fog, inclement weather, and dense overhead vegetation negatively impact passive NVDs. (See TC 3-22.9 for more on using NVDs.)

1-31. IR imaging sensors work by amplifying the mid- and far-wavelengths of the IR band to create a digital picture representing the total IR radiation of an object and its background. IR sensors are generally passive

devices. IR sensors work effectively in jungle environments in all lighting. The performance characteristics of an IR sensor determines its capabilities to see through different densities and types of atmospheric obscurants. (See ATP 3-04.64/MCRP 3-20.6 [MCRP 3-42.1A]/NTTP 3-55.14/AFTTP 3-2.64, MCRP 3-20.5 [MCWP 3-42.1], and TC 3-22.9 for more information on IR sensors.) IR imaging sensors are effective during all environmental conditions.

1-32. Sensor systems operate in one of two modes:

- Active. Active sensors emit energy that reflects from targets and is recaptured by the emitting or other nearby sensor, indicating the presence of a target. Examples of active sensors are searchlights and radar.
- Passive. Passive sensors do not emit energy; they collect energy, which may indicate the presence of a target. Examples of passive sensors are the human eye, NVDs, IR imaging devices, acoustic sensors, and photographic devices.

1-33. Correction of indirect and aerial fires can be complicated in the jungle environment. Heavy tree cover can cause munitions to detonate in the overhanging branches. Troops can overcome this early detonation by using special fusing. Additionally, troops may fail to observe the impact of rounds due to limited observation ranges requiring adjustment of fires to be conducted using other methods.

AVENUES OF APPROACH

1-34. Roads and trails crisscross many jungle areas, the majority of which are unimproved and not all-weather capable. Improved all-weather roads that support wheeled vehicles are rare; complex road systems beyond simple commercial links generally do not exist. For centuries, locals have used simple roads and trails to connect centers of commerce, collection points, and natural resources such as mineral deposits and timber resources. Roads and trails in jungle regions support dismounted movement. Speed of movement varies depending on the weather, ground composition, wet gap crossings, and topographical influences.

1-35. The relatively few improved all-weather routes in many jungle areas will channelize movement of wheeled and tracked vehicles. Logistics units are heavily impacted by this scarcity and channelizing as they require improved routes in order to maintain the line of communications (LOC) for their large, mission-essential vehicles that have limited off-road trafficability.

1-36. Jungle regions use rivers and streams as highways to move large amounts of material any significant distance. These rivers and streams often have heavy overgrowth providing concealment from ground and aerial observation. The threat of fluctuating water levels due to precipitation, or the lack thereof, poses significant danger to Soldiers/Marines and their equipment as they traverse rivers and streams. Flooding may occur even when it is not raining in the immediate area. Before crossing rivers or streams, units reconnoiter the far side of the linear obstacle for both trafficability and security. Enemy forces in covered and concealed positions can easily engage exposed Soldiers and Marines during gap crossings.

1-37. Normally mangrove and palm swamps prove impassable to all but the lightest equipped forces. Regardless, any force requires detailed reconnaissance to assess trafficability. Many jungles have swamp areas associated with rivers and streams as well as along the sea coast. Old trails or paths may cross the swamp, which are visible from the ground but invisible from aerial observation. Trafficability of swamps directly relates to the depth of the water, which can vary widely based upon precipitation and the time of the year.

1-38. Exploration for and production of oil and other natural resources means wells, pipelines, refineries, quarries, and crushing plants may be of strategic importance in the jungle. Pipelines installed 3 feet (1 meter) off the ground inhibit movement. Subsurface pipelines can also create an obstacle. In Southwest Asia, maps generally indicate locations of subsurface pipelines. Often, these pipes are buried at such a shallow depth that heavy vehicles can damage them when traversing them. Furthermore, if a pipeline ruptures, not only is the spill of oil a consideration, but the fumes may be hazardous as well.

1-39. Agriculture in jungle areas typically has large effects on trafficability. The dike systems associated with rice paddies can limit surface mobility and create choke points. Large plantations create areas with great amounts of trafficability for mounted and dismounted forces. Abandoned small farms can create small pockets of secondary jungle which significantly decreases trafficability.

KEY TERRAIN

1-40. *Key terrain* is an identifiable characteristic whose seizure or retention affords a marked advantage to either combatant (ADP 3-90). Key terrain in the jungle can be any man-made feature, water crossing, water way, or high ground. Because there are few man-made features in the jungle, those that do exist can become important, perhaps even key. Bridges over waterways, regardless of size, often become key terrain due to their relative scarcity. The high ground in the jungle can be key terrain, but limited observation and fields of fire may reduce their importance.

1-41. In jungle regions, navigable waterways are extremely likely to be key terrain. They often offer the only way to move large amounts of people, supplies, and equipment significant distances relatively rapidly. The meandering routes and variability of water flows complicates their utilization and security.

OBSTACLES

1-42. Obstacles abound in jungle regions. Jungle are generally large natural obstacles to wheeled and tracked vehicles as well as dismounted troops. Waterways, thick to impenetrable vegetation, steep slopes, swamps, water saturated soils, and mountains all hinder cross-country movement.

1-43. The few trafficable areas in the jungle are ideal for employing man-made obstacles as the natural terrain denies readily available bypass routes. Buried mines of all types are incredibly effective in jungle regions due the ability of vegetation to hide any evidence of their emplacement.

1-44. Rivers and streams can pose a danger to moving units, as they can appear unexpectedly, and vehicles and personnel can fall off the elevated embankment. The embankments of a river of stream may have heavy erosion and collapse under the weight of personnel or vehicles. River and stream embankments are particularly difficult to detect when conducting operations using NVDs, with limited ambient illumination, and thick vegetation.

Water

1-45. Annual precipitation rates in the jungle are the highest in the world. Many of the major rivers of the world, or their tributaries, are part of the jungle regions. The Amazon River traverses the Amazon Rainforest and is the largest river in the world. The movement and presence of water in jungle is its defining characteristic and has a large impact on military operations.

Vegetation

1-46. Jungle vegetation usually grows in dense concentrations and often provides concealment from the ground and air. Numerous edible plants and shrubs grow in the jungle that Soldiers/Marines can eat in survival situations.

1-47. Many jungle plants and shrubs have toxic resins that can cause blisters. Milky sap and red beans or berries are indicative of poisonous and dangerous plants. The danger from poisonous plants in the jungle is comparable to the woods of the United States eastern seaboard. Soldiers/Marines can avoid many of the dangers associated with poisonous vegetation by keeping their sleeves down and wearing gloves when practical. (Refer to ATP 3-50.21 for more information on poisonous and edible plants.)

WILDLIFE

1-48. Jungles host an impressive array of biodiversity and contain many animal species that can harm troops. Paragraphs 1-49 through 1-62 broadly describe various animal species that pose a threat to Soldiers/Marines. (For more information on the various plants and animals encountered in the jungle, refer to ATP 3-50.21.)

INSECTS

1-49. Numerous biting and stinging insects inhabit the jungle. Troops with known allergies to insect bites and stings must deploy with epinephrine auto-injectors. Medical providers should have higher than normal on-hand quantities of epinephrine due to the prevalence of biting and stinging insects in the jungle.

1-50. Mosquitoes are the most dangerous of the tropical insects. The largest health threat posed by mosquitoes is malaria, but mosquitoes carry numerous other diseases such as chikungunya, dengue, and yellow fever. Additionally, mosquitoes can carry heartworm larvae that can infect military working dogs.

1-51. Precautions against malaria and other mosquito borne diseases include—

- Taking prescribed antimalarial prophylactic medication.
- Taking prescribed heartworm prophylactic medication (military working dogs).
- Using insect repellent.
- Wearing permethrin-impregnated clothing that covers as much of the body as possible.
- Using nets or screens at every opportunity.
- Avoiding the worst infested areas when possible.

1-52. Mosquitoes are most prevalent early at night and just before dawn. Troops must be especially cautious at these times. Malaria is more common in populated areas than in uninhabited jungle, so troops must also be especially cautious when operating around villages.

1-53. Flies can pose a health hazard to humans; they can carry and spread diseases if not controlled. Certain flies that feed on mammals and humans can cause lesions and infections. Troops can take the following precautions to protect against flies:

- Use insect repellent.
- Wear permethrin-impregnated clothing that covers as much of the body as possible.
- Use nets or screens at every opportunity.
- Avoid the worst infested areas when possible.

1-54. Wasps and bees are common in some jungle regions, but they will rarely attack unless their nests are disturbed. When a nest is disturbed, troops must leave the area and reassemble at the last rally point. In case of stings, Soldiers/Marines seek medical attention.

1-55. Centipedes, spiders, and scorpions that inhabit the jungle can inflict painful stings. These insects prefer dark places. As such, Soldiers/Marines should shake out sleep systems and ensure clothing and boots are free of insects before dressing. Spider bites can be painful and often require medical treatment due to necrotic tissue and secondary infection. Ants can be dangerous to troops that are lying in the prone, sleeping, or injured and unable to move. Wounded troops should be placed in an area free of ants.

1-56. In Southeast Asian jungles, the rice borer moth of the lowlands collects around lights in great numbers during certain seasons. It is a small, plain-colored moth with a pair of tiny black spots on the wings. It should never be brushed off roughly, as the small barbed hairs of its body may be ground into the skin. This causes a sore, much like a burn, that often takes weeks to heal.

LEECHES

1-57. Leeches are common in many jungles, particularly throughout most of the Southwest Pacific, Southeast Asia, and the Malay Peninsula. They are found in swampy areas, streams, and moist jungle country. They are not venomous, but their bites may become infected if not cared for properly. The small wound that they cause may provide a point of entry for infectious diseases that cause tropical ulcers or "jungle sores." Troops operating in the jungle should watch for leeches on the body and brush them off before they have had time to bite. When they have taken hold, they should not be pulled off forcibly because part of the leech may remain in the skin. Leeches will release themselves if touched with insect repellent, a moist piece of tobacco, the burning end of a cigarette, a coal from a fire, or a few drops of alcohol.

1-58. Straps wrapped around the lower part of the legs ("leech straps") will prevent leeches from crawling up the legs and into the crotch area. Soldiers/Marines securely blouse or tuck their trousers into their boots to hinder leech access.

SNAKES

1-59. While traveling in jungle environments, troops must stay alert to and avoid disturbing snakes. Troops should be particularly watchful when clearing ground. Each jungle region has certain species indigenous to

the area. Before deploying, Soldiers/Marines access the electronic *DOD Foreign Clearance Guide (FCG)* for the area accessible at <https://www.fcg.pentagon.mil/>. Section VII, "Travel Information," of the guide identifies diseases caused by local insects. Units need to establish a procedure for treating snakebites. Antivenin is used to treat venomous snakebites. Antivenin is specific to a snake species; there is not a universal snake antivenin. Depending on the availability of antivenin, and the ability to properly store it, snake bite victims may require urgent medical evacuation and treatment at the next higher echelon of medical care.

Note. Treat all snakebites as venomous. For treatment of snakebites, refer to TC 4-02.1.

ALLIGATORS, CROCODILES, AND CAIMANS

1-60. Alligators, crocodiles, and caimans are semiaquatic carnivorous reptiles that live in tropical areas. Crocodiles are extremely sensitive to cold while alligators can endure cold temperatures. Crocodiles inhabit fresh, brackish, and salt water environments; alligators and caimans are generally fresh water reptiles. Highly effective ambush predators, numerous documented cases of alligator, crocodile, and caiman attacks on people exist throughout the world. These territorial creatures will often attack to protect their nesting areas. Troops should exercise care when conducting operations in and around water inhabited by alligators, crocodiles, or caimans.

OTHER JUNGLE ANIMALS

1-61. In the jungles of Sumatra, Bali, Borneo, Southeast Asia, and Burma there are tigers, leopards, elephants, and Asian buffalo. Latin American jungles are inhabited by the jaguar, and Africa hosts lions, leopards, buffalo, and elephants. Ordinarily, these animals will not attack unless they are cornered or wounded.

1-62. Water buffalo and elephants are used throughout Asia for agricultural and timber work. They may appear tame, but they are not truly domesticated and should only be handled by experienced trainers and handlers. Troops should avoid these animals.

ENVIRONMENTAL EFFECTS ON PERSONNEL

1-63. Properly prepared Soldiers/Marines should have no reason to fear the jungle. The jungle is neutral and affects combatants equally. The combatant whose personnel and equipment are best prepared for jungle operations has a distinct advantage.

1-64. The jungle is fatiguing, both physically and mentally. Discipline is essential and a single lapse may jeopardize the mission and endanger Soldiers/Marines. Challenges associated with communications, situational awareness, and movement and maneuver/maneuver require that commanders exercise a high level of leadership and train their subordinates to assume greater responsibilities. Troops with good leadership are more apt to perform well under arduous conditions. Leaders must ensure all Soldiers/Marines clearly understand why they are fighting in such harsh conditions and keep their troops informed of the operational situation.

1-65. Welfare is an essential factor to maintaining morale in a harsh environment. Welfare covers more than simply providing mail and clean clothing. Leaders need to keep troops healthy and physically fit. They must provide troops adequate, palatable, regular food, and allow them periods of rest and sleep. These things will not always be possible, and discomfort is inevitable, but if Soldiers and Marines know that their leaders are doing everything they can to make life tolerable, they will more readily accept the extremes brought on by the environment.

1-66. Climatic stress on the human body in hot jungles can stem from any combination of air temperature, humidity, air movement, and radiant heat. Other factors—lack of acclimatization, dehydration, alcohol consumption, lack of sleep, and poor health—also adversely affect the body.

HEAT INJURIES

1-67. Jungle characteristics include high heat and humidity. Soldiers/Marines operating in the jungle have a greater risk of heat injury than Soldiers/Marines operating in more temperate environments. To maintain an optimum temperature of 98.6 degrees Fahrenheit (37 Celsius), the body produces sweat which, when it evaporates, cools the body. However, high humidity inhibits evaporation and reduces the cooling effect which leads to a greater risk of heat injury.

1-68. The extreme heat of the jungle often causes heat exhaustion and heatstroke and puts forces at risk of degraded performance. For optimum mental and physical performance, Soldiers/Marines must maintain body temperatures within narrow limits and enable the body to lose the heat it gains during work. The amount of heat accumulation in the human body depends upon the amount of physical activity, level of hydration, and the state of personal heat acclimatization. Leaders monitor their troops carefully for signs of heat distress and adjust schedules, work rates, rest, and water consumption according to conditions.

1-69. Heat injury is an environmental injury that results when a Soldier/Marine is exposed to extreme heat for extended periods. Mental sharpness and performance can be adversely affected with an increase of just two degrees Fahrenheit (1.1 Celsius) above normal. If the heat stress continues to increase and is not checked, a rise of five degrees Fahrenheit (2.7 Celsius) can result in serious illness, injury, and death. Heat stress slows reaction times and decision making; routine tasks are done more slowly. At the first evidence of heat illness, leaders have troops stop work, move into shade, and rehydrate. Early intervention is important. Heat injuries consist of heat rash, heat cramps, heat exhaustion, and heat stroke.

WARNING

One heat casualty is often followed by others and is an indication that the entire unit may be at risk.

Heat Rash

1-70. Heat rash is caused by restrictive clothing, excessive sweating, and inadequate hygiene. It can develop when sweat ducts become blocked and often leads to discomfort and itching. Heat rash can prevent effective sweating and increase a Soldier/Marine's risk for heat injury. Heat rash looks like dots or tiny pimples. The affected areas can get irritated by clothing or scratching. In rare cases, heat rash may cause a secondary skin infection.

Heat Cramps

1-71. Heat cramps are painful muscle cramps that may occur after exposure to heat and are caused primarily by the excessive loss of mineral salts from the body. Heat cramps differ from exertional muscle cramps in that the entire muscle is not involved. Heat cramps normally involve the muscles of the arms, legs, and abdomen. Severe heat camps can render a Soldier/Marine ineffective. Heat cramps may be an early indicator of more dangerous heat injuries such as heat exhaustion.

Heat Exhaustion

1-72. Heat exhaustion is the most common form of heat injury and generally not associated with evidence of organ damage. This condition results from excessive loss of both salt and water, usually due to profuse sweating as the body attempts to cool itself. Classic symptoms of heat exhaustion include profuse sweating, trembling, weakness, and loss of coordination. Additional symptoms may include headache, tingling in the hands and feet, paleness, difficulty breathing, irregular heartbeat, loss of appetite, nausea, and vomiting. The skin is generally cool and moist from the evaporation of sweat, the pulse rate is rapid (120 to 200 beats per minute), blood pressure may be low, and rectal temperature is usually elevated.

Heat Stroke

1-73. Heat stroke is the most dangerous heat injury and results from the body's heat balance mechanism collapsing and the primary method of heat loss (cooling by evaporation of sweat) shutting down. Early signs of heat stroke include headache, dizziness, delirium (mental confusion), weakness, nausea, vomiting, and excessive warmth; however, sweating may or may not be absent. The most significant sign of heat stroke is a body core temperature of over 106 degrees Fahrenheit (41.1 Celsius) with a rectal temperature exceeding 108 degrees Fahrenheit (42.2 Celsius). Although the casualty may first progress through the symptoms of heat cramps or heat exhaustion, the onset of heat stroke may occur with dramatic suddenness. The victim of heat stroke often lose consciousness and suffer convulsions or seizures.

DANGER

Heatstroke is a medical emergency. Seek medical attention immediately.

Heat Injury Prevention

1-74. Heat injuries are not inevitable during jungle operations. Proactive leaders can take steps to prevent their Soldiers/Marines from becoming heat casualties. In addition to educating Soldiers/Marines on the risk factors, signs, symptoms, and prevention of heat injuries, leaders must monitor their subordinates' performance and adjust work conditions to provide troops with adequate rest and recovery in accordance with the heat category.

Risk Factor Recognition

1-75. Leaders recognize and address the following risk factors that increase the likelihood of heat injury:

- High heat category, especially on several sequential days.
- Lack of adequate meals or failure to eat.
- Strenuous training or operations over the course of several sequential days.
- Excessive heat exposure and limited recovery time.
- Lack of acclimatization.
- Lack of sleep.
- Poor fitness (unable to run two miles in less than 16 minutes).
- Excessive weight or obesity.
- The symptoms of illnesses, such as a cold, sore throat, low-grade fever, nausea, vomiting, and diarrhea.
- Use of medications that inhibit sweating, such as atropine, antihistamines, tranquilizers, cold medicines, and antidiarrheal medications.
- Use of alcohol to the point of intoxication in the previous 24 hours.
- Prior history of heat injury (any heat stroke, or more than two episodes of heat exhaustion).
- Skin disorders such as heat rash or sunburn that prevent effective sweating.
- Soldiers/Marines over the age of 40.
- Tight clothing that restricts air flow over the body.

1-76. Proper hydration is vital to preventing heat injuries. Leaders ensure adequate quantities of potable water are available for Soldiers/Marines during jungle operations and must encourage and monitor consumption. See paragraphs 1-94 and 1-95 for information on hydration techniques during jungle operations.

1-77. Soldiers/Marines that expend more calories than they consume increase their risk of suffering a heat injury. Soldiers/Marines may lose their desire for food in hot climates. Leaders ensure Soldiers/Marines eat, with the heavier meal of the day scheduled during the cooler hours.

1-78. Leaders use the wet bulb-globe temperature (WBGT) index to accurately measure the environmental risk factors for heat injury and adjust work/rest cycles and water consumption accordingly. The wet bulb measures the combined effects of the sun, air temperature, and humidity and then classifies this data according to one of five heat categories. Leaders then adjust work to rest ratios and water consumption rates in accordance with exertion levels and the heat category. Despite this framework, leaders must recognize that non-acclimated Soldiers/Marines will likely require more water and more frequent rest periods than acclimated Soldiers/Marines. (See ATP 4-25.12 for more information on heat injury prevention, the WBGT index, and operating instructions for the WBGT index kit.)

1-79. To be effective, the wet bulb must be set up in conditions similar to those under which the Soldiers/Marines are operating and must be checked hourly when the ambient temperature is above 75 degrees Fahrenheit (23.8 Celsius). Table 1-1 presents the work/rest cycles and recommended water consumption rate in accordance with the heat category and level of exertion.

Table 1-1. Work/rest and water consumption guide

Heat category	*WBGT index in degrees Fahrenheit*	*Easy work*		*Moderate work*		*Hard work*	
		Work/rest minutes	*Water intake (qt/hr)*	*Work/rest minutes*	*Water intake (qt/hr)*	*Work/rest minutes*	*Water intake (qt/hr)*
1	78°–81.9°	NL	½	NL	¾	40/20	¾
2 (Green)	82°–84.9°	NL	½	50/100	¾	30/30	1
3 (Yellow)	85°–87.9°	NL	¾	40/20	¾	30/30	1
4 (Red)	88°–89.9°	NL	¾	30/30	¾	20/40	1
5 (Black)	>90°	50/10	1	20/40	1	10/50	1

Notes.
The work/rest times and fluid replacement volumes will sustain performance and hydration for at least 4 hours of work in the specified heat category. Individual water needs will vary ± ¼ qt/hr.
CAUTION: Hourly fluid intake should not exceed 1.5 quarts. Daily fluid intake should not exceed 12 quarts.
Wearing body armor in humid climates adds 5°F to the WBGT index.
Wearing chemical, biological, radiological, and nuclear protective ensemble in humid climates adds 10 °F to the WBGT index.

°F	degrees Fahrenheit	NL	no limit to work time per hour
>	greater than	qt/hour	quart per hour
±	plus or minus	WBGT	wet bulb-globe temperature

Modifications

1-80. In addition to monitoring their Soldiers/Marines' performance and the environmental conditions, leaders may modify work schedules to mitigate the risk of heat injuries. Work done in the heat of the day takes much longer and is more fatiguing than work done under relatively cooler conditions. Working during cooler periods, such as early morning, late evening, and night, not only increases productivity and reduces the likelihood of heat injuries, but it may also improve morale.

1-81. In accordance with local policy and operational conditions, commanders may modify the uniform to account for changes in the heat category. Leaders also recognize that wearing personal protective equipment (known as PPE), such as body armor, increases heat stress and adds five degrees Fahrenheit (2.7 Celsius) to the WBGT index. Performing easy work while wearing chemical, biological, radiological, and nuclear (CBRN) protective equipment adds ten degrees Fahrenheit (5.5 Celsius) to the WBGT, while performing moderate or hard work in CBRN protective equipment adds 20 degrees Fahrenheit (11 Celsius) to the WBGT index. Suggested uniform modifications include:

- Heat categories one and two—no modifications.
- Heat category three—unblouse trouser legs.
- Heat categories four and five—

- Unblouse trouser legs and unbuckle web belt or vest.
- Remove undershirt from uniform top or, if conditions permit and biting insects are not present, remove uniform top down to undershirt.
- If conditions permit, remove helmets.

Acclimatization

1-82. Leaders prevent heat injuries by allocating time and resources for acclimatization. Approximately one week of daily heat exposure is necessary to induce heat acclimatization; however, Soldiers/Marines who are unusually susceptible to heat injuries require additional time to fully acclimatize. Heat acclimatization requires a minimum daily heat exposure of approximately two hours that may be conducted in two, one-hour exposures. These exposures should consist of physical exercise that requires cardiovascular stress, not strength training. Leaders gradually increase the exercise intensity and duration each day to induce acclimatization.

1-83. Acclimatization to heat is necessary to permit the body to reach and maintain efficiency in its cooling process. However, situations may arise when troops cannot become fully acclimatized before leaders require them to perform hard work. When this happens, troops conduct hard work following guidelines established in table 1-1 on page 1-13, and leaders limit hard work to cooler hours and allow troops to rest frequently.

DEHYDRATION

1-84. Although causally related to heat injuries, dehydration may occur regardless of temperature; however, Soldiers/Marines operating in the high heat and humidity of the jungle have an increased risk for dehydration. If they do not replace bodily fluids lost through sweat, dehydration will occur. Potable drinking water is the most important need for Soldiers/Marines in the jungle. Water is easy to find in jungle environments; however, Soldiers/Marines should consider water from natural sources as contaminated. Maintaining adequate potable water supplies is critical. Troops cannot perform to maximum efficiency on a decreased water intake.

1-85. Leaders estimate how much water troops need and when they will need it. Before missions, leaders ensure troops properly hydrate regularly. During the mission, effective leaders take steps to ensure Soldiers/Marines replace the water lost through sweat while monitoring the water supply to prevent over consumption. After the mission, leaders ensure Soldiers/Marines replace lost fluids to support future operations. When they have limited water supply, leaders adjust their plans in accordance with the established priorities for water usage.

1-86. Monitoring hydration requires balance; leaders encourage hydration while discouraging wasteful behavior. Effective leaders also recognize that Soldiers/Marines may neglect proper hydration and hoard water if they believe it is a scarce resource. Leaders must be aware that thirst does not always adequately indicate dehydration. Adrenaline or excitement may prevent Soldiers/Marines from realizing they are thirsty or drinking adequate water before they become dehydrated.

Symptoms and Effects of Dehydration

1-87. Symptoms of dehydration include dizziness, weakness or fatigue, blurred vision, thirst, and dark, concentrated urine. Chronic dehydration increases the incidence of several medical problems including constipation, kidney stones, and urinary infections.

1-88. Approximately 75 percent of the human body is fluid. All chemical activities in the body occur in a water solution. Proper organ function requires water for removing waste and regulating body temperature. A loss of two quarts of body fluid (2.5 percent of body weight) decreases efficiency by 25 percent and a loss of fluid equal to 15 percent of body weight is usually fatal.

1-89. The body has a small reserve of water and can lose some without any effects. After a loss of about two quarts (which represents about 2.5 to 3.0 percent of body weight), effectiveness is impaired. Soldiers/Marines may begin to stumble, become fatigued, lose the ability to concentrate, and develop headaches. Thirst will be present but not overpowering. Unless well trained or reminded to drink, troops may not replace the water loss. Leaders at all levels must monitor troops and enforce proper hydration.

1-90. As dehydration continues, the effects become more pronounced. Soldiers/Marines become less effective and more likely to become a heat casualty. Some troops will experience heat cramps, others will develop heat exhaustion or heat stroke. Heat cramps and heat exhaustion may be effectively treated if caught early. However, without prompt medical attention, heatstroke can prove fatal. Preventing casualties is much easier than treating and replacing casualties.

1-91. Dehydration nullifies the benefits of heat acclimatization and physical fitness; it increases the susceptibility to heat injury, reduces the capacity to work, and decreases appetite and alertness. A lack of alertness can indicate early stages of dehydration.

1-92. Dehydration is often accompanied by the loss of salt and other electrolytes necessary for bodily functions; the more Soldiers/Marines sweat, the more salt they lose. To mitigate this, the issued ration has enough salt for a Soldier/Marine drinking up to four quarts of water per day. Soldiers/Marines should attempt to get their required daily salt intake through meals provided. As they drink additional liquids to account for water lost through sweat, Soldiers/Marines eat accordingly to replace the accompanying salt lost. However, the administration of intravenous salts or saline should only occur under medical authority and supervision for Soldiers/Marines suffering from dehydration or heat injury. Salt, in excess of body requirements, may cause increased thirst and can be dangerous.

Dehydration Prevention

WARNING

Consuming over 12 quarts of water in a single day may put Soldiers/Marines at risk for hyponatremia, a potentially fatal medical emergency where water consumption flushes electrolytes from the body faster than they can be replenished. Hourly fluid intake should not exceed 1.5 quarts.

1-93. While working in high jungle temperatures, a Soldier/Marine at rest may lose as much as half a quart of water per hour from sweating. If Soldiers/Marines are working, their water loss through sweat, and the subsequent requirement for replenishment, increases in proportion to the amount of work done. Soldiers/Marines may not always drink the necessary amount of water and will need to be encouraged to drink more than they think is necessary. This is particularly true during acclimatization. Artificial flavoring or electrolyte packets may be added to water to enhance palatability and encourage consumption.

1-94. Effective leaders understand the importance of proper hydration. The following considerations apply to proper hydration during jungle operations:

- Water is the key to health and survival.
- Consider water as a tactical weapon. Proper hydration increases individual and team effectiveness.
- Wearing personal protective equipment, such as body armor, adds 5 degrees to the WBGT and requires increased water intake. See Table 1-1 on page 1-13 for water consumption guidelines.
- CBRN protective equipment adds 10 degrees to the WBGT and requires increased water intake. See Table 1-1 on page 1-13 for water consumption guidelines.
- Larger individuals require more water.
- As activities increase or conditions become more severe, water intake needs increase in accordance with Table 1-1 on page 1-13.
- Carbohydrate and electrolyte beverages are not required, but, if used, should not be the only source of water. Carbohydrate and electrolyte beverages may be diluted with water at a 1:1 ratio.
- Dark urine may be an early indicator of dehydration; have Soldiers/Marines observe the color of their urine and report any significant changes to leadership and medical personnel.
- Salt loss can be replaced by eating meals.
- Diseases, especially diarrheal diseases, will complicate and often prevent proper hydration.

- Conditions that increase the risk of dehydration or heat injury include, but are not limited to, fatigue or loss of sleep, previous heat injury, and prescription medication use. Modify activities and closely monitor Soldiers/Marines prone to dehydration or heat injury.
- The first signs of heat stress and reduced effectiveness, such as a lack of sweat or chills, need treatment.
- Reduced workloads and the duration of physical activity during the first days of exposure to heat and humidity and a gradual increase in workloads and physical activity facilitates acclimatization.

1-95. To maintain the troops' welfare, leaders ensure Soldiers/Marines—

- Rest in the shade when possible.
- Carry as much water as possible when away from approved sources of drinking water. Soldiers/Marines can live longer without food than without water.
- Properly hydrate before hard work; fill all personal hydration systems prior to beginning work.
- Monitor individual consumption levels at the squad level; at the platoon level, monitor the consumption rate of each squad.
- Take breaks as often as the heat condition requires; during breaks, remind Soldiers/Marines to hydrate.
- Keep water as cool as possible.
- Use the buddy system to encourage proper hydration.

CAUTION

Dark or discolored urine is not always an accurate indication of dehydration and may indicate a more serious medical condition such as rhabdomyolysis or blood in the urine. Soldiers/Marines should seek medical attention immediately for brown or dark colored urine.

Water Storage Techniques

1-96. Troops protect water from enemy action as well as from heat and contamination. Excessive minerals, microbiological organisms, or other toxic substances may contaminate water. Because of this, Soldiers/Marines should avoid consuming water not yet treated by water purification specialists or medics. Troops also avoid enemy water sources in case the enemy deliberately poisoned them.

1-97. Water purification specialists or medics treat and disinfect water by adding chlorine to a level prescribed by the command surgeon. The chlorine not only kills the microbiological organisms present in the water but also kills organisms that might get into the water later. (See ATP 4-25.12 for proper chlorine dosing tables and potable water requirements.)

1-98. Water purification unit operators and medics treat and check water for contamination before distributing it to water points. However, these checks do not ensure the water will not become contaminated somewhere in the unit distribution system before a Soldier/Marine drinks it. To prevent water from becoming contaminated before consumption, units properly store treated water and prevent it from mixing with non-potable water sources, such as rain water. Units only store water in clean containers designed for water storage. The best containers for small quantities of water (five gallons or less) are plastic water cans or coolers. Troops can safely consume water properly stored in plastic cans for up to 72 hours; whereas water stored in metal containers is only potable for 24 hours.

1-99. Heat can also contaminate water. Heat reduces the disinfecting power of the chlorine dissolved in the water. If the air temperature exceeds 100 degrees Fahrenheit (38 Celsius), water purification specialists monitor its temperature. When the water temperature exceeds 92 degrees Fahrenheit (33 Celsius), they change the water to prevent the growth of bacteria. Units can reduce heat absorption by storing water cans and other containers in the shade. Field sanitation teams should have the equipment and supplies necessary to measure and maintain safe chlorine levels in water storage containers.

1-100. Water becomes difficult to drink when warmer than 75 or 80 degrees Fahrenheit (24 or 27 Celsius). Impurities and foul tastes are more pronounced as water becomes warmer. Water tastes best, and it is easier to drink necessary quantities of it, when between 50 and 60 degrees Fahrenheit (10 and 15 Celsius).

1-101. The type of container used to store potable water affects its temperature and palatability. Small, uninsulated water containers heat up more quickly than larger, insulated containers. When stored in direct sun in uninsulated, 5-gallon cans, 60 degree water can heat up to unpalatable temperatures in three to four hours on a hot (greater than 90 degrees Fahrenheit (32 Celsius)) day. However, this will take seven to eight hours if kept in the shade. Insulated, 400-gallon water trailers, in or out of the sun, will keep water cool for several days. Units identified to conduct jungle operations may also utilize supplemental items, such as a mobile water chiller, to keep water palatable. When they lack such equipment, Soldiers/Marines can use ice to keep water cool. If they use ice in 400-gallon (1,514 liter) water trailers, they need to remove the ice before moving the trailer to prevent damage to the inner lining of the storage tank.

1-102. Units need to make special accommodations for supplying water to mounted forces operating in the jungle. Mounted forces should carry enough water on a vehicle to last the crew until the next planned resupply. Units firmly attach water storage containers to the vehicle body to prevent excessive vibration and water loss. They keep storage containers in the shade and, if possible, exposed to an air draft. Finally, Soldiers/Marines store water containers on their vehicles where they are best protected from puncture by combat and easily dismounted in the event of a vehicle evacuation.

1-103. Leaders ensure their troops never mistake non-potable water for drinking water. Water that is not fit to drink, but is not otherwise dangerous, may be used for hygiene and other personal sanitation requirements.

Water Supply Planning

1-104. Water supply during jungle operations requires deliberate planning. Water is heavy, requires specialized equipment to store and distribute, and must be transported long distances. It is often required in large quantities, is perishable, and is absolutely essential to mission accomplishment. Units have several specialized pieces of equipment available to overcome these challenges. The equipment's design and allocation permit units to move and store the larger than normal volumes of water required in the jungle. Units can also have this equipment delivered by ground and air transportation, airdrop, or low altitude parachute extraction system. Air transportation, while possible, is usually limited by aircraft availability and the weight of the quantity of water required. Units normally use air transportation only in emergency situations when ground transportation is not feasible.

1-105. Planning water requirements for centralized service support functions (shower, laundry, medical treatment, maintenance, and construction) falls under the supporting organization's responsibility. The largest and most critical planning factor is drinking water. The quantity required depends on the environment, the number of troops, and the intensity of individual activity. The following questions guide unit water supply planning:

- How much water is needed?
- Where is it needed?
- When is it needed?
- How will water get to the unit?
- How does water supply affect the mission?
- How does the mission affect water requirements?
- What measures need to be taken to ensure water is properly used?

1-106. Units provide water to support immediate and future missions. Sometimes enough water exists to fulfill all requirements; however, when supplies are limited and demand is high, the commander must prioritize water allocation by purpose. The first priority must go to the survival of the force and accomplishment of the immediate mission. A general priority for water use is—

- Personnel (drinking only).
- Medical treatment.
- Vehicle and equipment cooling systems.
- Hygiene and personal sanitation.

- Decontamination.
- Food preparation.
- Laundry.
- Construction.

Water Requirements

1-107. Leaders and their units can do several things to use water to their advantage. First, they ensure enough potable water is available for drinking and deliver it as close as possible to the point of consumption. Troops working in the jungle should not have to walk more than a short distance to a water source. Leaders should make it easy for their Soldiers/Marines to get water.

1-108. When calculating water requirements for an entire day, leaders consider other requirements, such as shaving, brushing teeth, and personal hygiene. In addition to drinking water, these functions require almost two gallons of water per Soldier/Marine per day. If the unit prepares its own rations, leaders plan for 0.5 gallon per meal for food preparation and kitchen cleanup. A unit can reuse the water used to heat combat rations for washing and shaving.

1-109. When calculating drinking water requirements, leaders plan to use one quart of water per hour of hard work per Soldier/Marine (including rest periods) during the heat of the day, or .5 quart of water per hour of hard work per Soldier/Marine in the cooler parts of the day. Experience with local conditions and the work performed may change these estimates; however, leaders should monitor the WBGT and use Table 1-1 on page 1-13 to modify the work/rest cycle and water consumption.

1-110. How far the available water will stretch depends upon the commander's evaluation of the local situation and mission, how the commander sets priorities for water use, and how careful the commander is in using their limited supply. If a leader cuts water use to absolutely essential requirements, leaders can temporarily overcome limited water shortages, but severe shortages will limit the unit's mobility and capability. Water shortages may make some daylight operations or hard work infeasible or unsupportable. Each course of action (COA) must be analyzed with respect to water support requirements and the capacity of troops to sustain their efforts under severe heat.

1-111. Water supplies are equally important to the enemy. Taking and keeping water sources, or denying or destroying enemy water supplies, can critically alter the options available to the enemy.

COLD

1-112. Although jungles are generally hot environments, excessive rain, high humidity, and temperature fluctuations between altitudes and times of day may cause Soldiers/Marines to become cold. This exposure and the resulting discomfort can degrade performance. To prevent this, effective leaders ensure Soldiers/Marines have enough clothing and shelter to keep warm and dry. Jungle conditions are likely to soil clothing more rapidly than conditions in temperate or cold climates, and, at a minimum, Soldiers/Marines should have two sets of uniforms and undergarments for daily operations. The first set is worn during the day or when conducting operations, and another set is worn when recovering or sleeping. The uniform and undergarments worn during the day or during operations should be removed and dried while the Soldier/Marine rests or sleeps. Likewise, Soldiers/Marines should have two pairs of boots to allow a wet or soiled pair to dry before it must be worn again. Leaders conduct pre-combat checks and pre-combat inspections to ensure Soldiers/Marines have adequate clothing for operations.

SUNLIGHT

1-113. Sunlight can produce eyestrain, cause eye fatigue, and temporarily impair vision. Soldiers/Marines wear dark glasses or goggles that block or reduce ultraviolet rays to minimize the negative effects of sunlight on the eyes.

1-114. Overexposure of the skin to sunlight can result in sunburn. Sunburn is characterized by painful reddened skin that can result in blistering and may lead to heat injury by inhibiting the body's ability to sweat. All personnel are susceptible to sunburn, but different skin types have varying degrees of sensitivity. Troops with fair skin, freckled skin, ruddy complexions, or red hair are more susceptible to sunburn than others.

Soldiers/Marines can wear sunblock or sunscreen to prevent sunburn on exposed skin. Pay particular attention to protecting the skin of the face and hands as these areas are frequently exposed to prolonged sunlight. To protect from the sun, Soldiers/Marines operating in hot and sunny jungle environments, such as savanna, should remain in uniform but wear it loosely in accordance with the heat category. If leaders downgrade the uniform in accordance with heat category considerations, they should remove undergarments before removing the uniform blouse during sunny conditions. If Soldiers/Marines remove the uniform blouse, then they should apply sunblock or sunscreen to the exposed skin of the arms.

HEALTH CONSIDERATIONS

1-115. Diseases common to the jungle include Chagas disease, dengue fever, trypanosomiasis, leishmaniasis, leprosy, lymphatic filariasis, malaria, and onchocerciasis. Viruses, protozoa, nematodes, parasitic worms, and bacteria cause these diseases, but the most common vectors for these diseases are flies, mosquitoes, or water. Proper preventive medicine techniques and procedures are critical to protecting Soldiers/Marines from diseases commonly found in the jungle.

1-116. Diseases that cause dehydration through vomiting and diarrhea increase the risk of heat injury. Fever also makes Soldiers/Marines prone to heat injury and complicates distinguishing between heat injury and disease. Because of this, Soldiers/Marines with elevated temperatures, vomiting, and diarrhea should seek medical treatment as soon as possible. Leaders monitor these individuals and adjust the work/rest cycle as conditions permit to prevent further complications and enable recovery.

Hygiene

1-117. Proper hygiene not only maintains morale but is the first line of defense against disease. In the absence of sufficient clean water for hygiene, Soldiers/Marines should clean themselves with sponge baths, solution-impregnated pads, a damp rag, powder baths, or even a dry, clean cloth. Troops avoid using untreated water for hygiene or washing clothes as it can spread disease. Leaders ensure troops dispose of waste water in an approved area to prevent insect infestation.

Diet

1-118. Soldiers/Marines can contract rare jungle diseases, such as Ebola, either by consuming bush meat or through close contact with infected persons. To prevent contracting these illnesses, Soldiers/Marines avoid consuming bush meat, such as monkeys and bats, and avoid contact with infected persons. They should also avoid visiting live animal markets and keep their distance from livestock. Live animal markets are markets where animals are brought, sold, and killed for subsequent consumption.

Latrines

1-119. Although common in areas with poor sanitation, enteric diseases can be prevented through good hygiene, proper food handling and meal preparation, and the appropriate siting and construction of field expedient latrines. Engineers locate latrines well away and downwind of bivouac sites or patrol bases. Troops dig and construct improvised latrine systems using readily available materials generally when they establish a new base of operations. If the unit remains in one location for up to three days, it uses a straddle trench latrine. It may be suitable in savanna or other jungles with moderately firm soil and lower water tables. Straddle trenches should be dug at least two and a half feet (76 meters) deep to prevent them from overflowing with rain water. Troops build a mound latrine when a straddle trench latrine is not feasible due to a high water table or unstable soil. A mound of earth with a top of at least 6 feet wide and 12 feet long (1.8 meters wide by 3.6 meters long) is formed, and a four-seat latrine is placed on top. Troops dig a pit into the mound when the mound has reached the desired height. Additionally, troops cover the latrine opening with a lid to prevent the transmission of disease by flies. (Refer to ATP 4-25.12 for further information on waste management.)

Water Exposure

1-120. The jungle's excessive heat and humidity can cause fungal infections of the skin such as Tinea Versicolor, Tinea Cruris (jock itch), and Tinea Pedis (athlete's foot). Although rarely severe on their own, fungal infections may be complicated by heat rash, sunburn, immersion syndrome, or other dermatological

conditions and can degrade performance. To prevent fungal infections, Soldiers/Marines regularly wash areas of the body that produce excessive sweat and change underwear and socks frequently. The use of foot and body powder may also prevent infection. Medics treat Soldiers/Marines suffering from fungal infections with antifungal medication and allow the affected area to dry as much as conditions permit.

1-121. Immersion syndrome (trench foot) is common in wet environments and usually occurs after prolonged exposure to water (greater than 12 hours). Initial symptoms include swelling, redness, and a numbing sensation. As the condition progresses, the tissue may become pale. Often, aches, increased sensitivity to pain, and infections accompany immersion syndrome. Preventive measures include keeping feet clean and dry by changing from wet or damp socks to dry socks as soon as possible. Soldiers/Marines should remove boots when sleeping to allow the feet and boots to dry. If possible, Soldiers/Marines alternate wearing pairs of boots to allow them to dry completely. Soldiers/Marines who develop immersion syndrome require immediate medical attention. Affected tissues should by cleaned and dried gently to prevent further damage. If possible, do not allow the Soldier/Marine to walk on the injured extremity. Do not massage, rub, moisten, or expose the affected area to extreme heat or lotions. Do not pop blisters.

1-122. Soldiers/Marines may experience chafing after marching or patrolling in wet clothing. Applying body powder or petroleum jelly to the skin may alleviate the friction that causes chafing. Wearing spandex undergarments may also prevent chafing in the groin and inner thigh.

Preventive Measures

1-123. Both enteric and insect-borne diseases can be prevented. Leaders break the chain of transmission from infected sources to susceptible troops by effectively applying the preventive measures contained in ATP 4-25.12 and ATP 3-34.5/MCRP 3-40B.2 (MCRP 4-11B).

1-124. Additional preventive measures for hygiene:

- Bathe with clean, treated water as often as practicable.
- Shakeout boots, clothing, and bedding before using them.
- Separate mess facilities and refuse areas from living and sleeping areas; food and garbage attract animals and insects.
- Do not handle insects, arthropods, snakes, or other animals.

1-125. Additional preventive measures for diet:

- Obtain water from approved water points and sources.
- Purify suspect water sources in accordance with the methods prescribed in ATP 4-25.12.
- Use purified water for hand washing and food preparation.
- If forced to collect rain water, wait to do so until it has rained for at least 30 minutes. This reduces the risk that impurities from the jungle canopy are washed into the water container. Water intended for personal consumption must be treated with iodine purification tablets. (See ATP 4-25.12 for more information on water purification tablets.)
- If possible, procure all food, water, and ice from approved U.S. military sources inspected by veterinary food inspectors.
- Do not consume bush meat, such as monkeys or bats.
- Avoid close contact with livestock.
- Avoid visiting live markets or markets where live animals are brought and killed after being sold.
- If forced to consume locally procured food, ensure it is carefully stored, handled, washed, and prepared.
- Cook all foods thoroughly.
- Wash and peel locally procured fruits and vegetables before consumption.
- Avoid local dairy products. Local dairy products are often not pasteurized and may contain dangerous bacteria such as salmonella, E. coli, listeria, campylobacter, and other pathogens that can cause foodborne illness.

1-126. Additional preventive measures for latrines:

- Establish hand washing stations at both latrines and mess facilities.

- Dispose of human waste and garbage as specified in ATP 4-25.12 and addressed in ATP 3-34.5/MCRP 3-40B.2 (MCRP 4-11B).

1-127. Additional preventive measures for water exposure:

- Wear clean, dry, loose-fitting clothing whenever possible.
- Do not sleep in wet, soiled, or dirty clothing. Instead, troops should carry a dry set of clothing just for sleeping. This practice not only prevents fungal, bacterial, and immersion injuries, but also prevents chills and allows troops to rest better.

Note. Refer to ATP 4-25.12 for more information on field sanitation techniques. Soldiers/Marines may also refer to TB MED 530/NAVMED P-5010-1/ AFMAN 48-147_IP for more information on established standardized military food safety standards, criteria, procedures, and roles for the sanitary control and surveillance of food to mitigate risk factors known to cause foodborne illness.

ENVIRONMENTAL EFFECTS ON EQUIPMENT

1-128. Jungle heat and humidity affects both troops and equipment. Canvas items rot and rubber deteriorates much faster than in more temperate areas. Battery life is shorter than normal and electrical connections corrode quickly. Lenses, dials, and gauges often become fogged with internal moisture.

HEAT

1-129. Air and fluids expand and contract according to ambient temperature while extreme heat can increase pressure in closed pressurized systems affecting performance. High temperatures may also cause halon fire suppression systems to discharge spontaneously. Some types of equipment have thermal cutouts that open circuit breakers whenever equipment begins to overheat. Troops ensure that the working pressure and temperatures of all equipment falls within safety limits in accordance with the appropriate technical manual (TM).

1-130. Vehicle cooling and lubrication systems are interdependent, and a malfunction by one will rapidly place the other system under severe strain. When operated under extreme temperatures, vehicle cooling and lubrication systems experience excessive wear that often results in leaking gaskets and seals. If not monitored and corrected, these issues will lead to engine failure. Leaders monitor vehicles prone to excessive overheating and ensure extra care is applied to their maintenance. Soldiers/Marines should refer to applicable TMs and lubrication orders for the equipment they are operating. The following considerations ensure engines do not overheat:

- Perform preventive maintenance checks and services in accordance with the applicable TM.
- Check oil levels frequently to ensure proper levels are maintained, recognizing that too much or too little oil may damage the engine.
- Inspect seals and gaskets for leaks.
- Report excessive oil consumption to maintenance personnel.
- Keep radiators and air flow areas around engines clean and free of debris and other obstructions.
- Tighten cooling hoses in accordance with the applicable TM; Class III leaks result in significant fluid loss.
- Do not remove hood side panels from engine compartments while the engine is running as this causes air turbulence and leads to ineffective cooling.

1-131. Batteries do not hold their charge efficiently in intense heat. The following are additional considerations for maintaining batteries in intense heat:

- Change battery-specific gravity to adjust to jungle conditions (see vehicle technical manuals for details).
- Maintain battery water levels in accordance with the applicable technical manual and carry a reserve of distilled water.
- Keep air vents clean or vapors may build up pressure and cause the battery to explode.

- Set voltage regulators as low as practical.
- Increase dry battery supplies to offset the high attrition rate caused by heat exposure.

1-132. Electronics equipment is adversely affected by high temperatures. Radios, computers, and network components often fail due to overheating. Failure of electronic components can cause advanced weapons, communications systems, aircraft, and vehicles to be non-mission capable. The following steps can help prevent overheating of electronic components:

- Keep electronics out of direct sunlight.
- Ensure that air can circulate freely around electronic components.
- Utilize low power settings when conditions allow.
- Keep vents uncovered.

1-133. Heat causes anomalies in the electromagnetic spectrum that shorten radio range during the hotter hours of the day. At night, range improves but static electricity may cause interference. Very high frequency communications range can decrease by as much as 50 percent because of high temperatures. (For more information on the effects of heat on tactical radio operations refer to ATP 6-02.53.)

HUMIDITY AND WATER

1-134. All jungles are humid and experience high levels of annual rainfall. Heat and humidity cause rust on bare metal and mold in enclosed spaces such as optics. Units must keep bare metal surfaces on equipment not required for immediate use clean and very lightly lubricated.

1-135. Store optics in dry locations. Troops keep air circulating around those optics in use and purge them at frequent intervals. Soldiers/Marines wash aircraft daily, particularly if there is salt in the air, using low-pressure sprays in accordance with corrosion prevention controls detailed in the applicable TM.

1-136. Electronic equipment is adversely affected by high humidity, rain, and water. Radios, computers, and network components often fail when exposed to excessive moisture. Equipment that conforms to military standards is designed to operate under certain levels of moisture. Soldiers/Marines consult the applicable technical manuals for specific equipment design characteristics and preventive maintenance checks and services requirements. To prevent electric shock and equipment failure in wet or stormy conditions, troops ground all electrical equipment in accordance with the applicable TM. Electronic component failure can cause advanced weapons, communications systems, aircraft, and vehicles to be non-mission capable. The following steps can help prevent the failure of electronic components due to wet conditions commonly experienced in the jungle:

- Protect electronics from visible moisture.
- Ensure that air can circulate freely around electronic components.
- Do not power on waterlogged electronic components. Allow them to fully dry prior to powering them on.
- Ensure components are properly grounded, if required.

UNIFORM AND PERSONAL PROTECTIVE EQUIPMENT

1-137. Properly worn uniforms protect troops from sunlight, noxious vegetation, and wildlife. The duty uniform is suitable for jungle operations so long as the camouflage pattern conceals the Soldier/Marine with the local environment. Protective eyewear should be issued and worn as part of the uniform. When not required to wear a helmet, Soldier/Marine wears a wide-brimmed hat to reduce heat stress and increase protection from sunlight better than a patrol cap. Soldiers/Marines should wear their uniform sleeves loose, but down and full-length trousers bloused into boots. Boots deteriorate quickly in the jungle, so units should coordinate with their respective supply officer for regular exchanges. Jungle boots are preferable to standard issue boots as the ventilation holes allow water to drain from the boot and increase ventilation.

1-138. Soldiers/Marines should adjust clothing layers to account for changing environmental conditions and physical exertion. They wear dry clothing closest to the skin to combat immersion injuries.

Chapter 2

Foundations for Jungle Operations

This chapter presents the fundamentals of jungle operations within the larger operational concept and framework. It frames jungle operations within the multiple domain battlefield and identifies cross-domain issues that commanders address for successful in this harsh environment. Finally, it offers techniques for executing jungle operations in accordance with the underlying principles and environmental considerations.

UNDERSTANDING JUNGLE OPERATIONS

2-1. Jungle operations encompass the range of military operations and span the competition continuum, from operations to shape and prevent, to large-scale combat and consolidation of gains. The Army/Marine Corps plan and execute jungle operations to either achieve or contribute to national or combatant commander objectives. These objectives may be physical, such as the seizure or retention of key terrain; enemy centric, like the defeat of an opposing force; or population centric, as in humanitarian relief operations. Operations in the jungle may form part of a larger campaign or stand as independent actions. Units conduct operations simultaneously or sequentially along lines of effort/lines of operation (known as LOOs). The jungle environment affects the accomplishment of the mission regardless of the type and purpose of the operation. Army/Marine Corps leaders conducting jungle operations—

- Understand the jungle environment to determine decisive points.
- Understand how the jungle affects operational and mission variables.
- Retain the ability to converge combat power at decisive points, despite the dispersed nature of jungle operations.
- Continually consolidate gains essential to retain the initiative.
- Tailor their tactics to the terrain and conditions prevalent in the jungle.

2-2. Operations in jungles tend to be isolated actions by small forces because of the difficulties associated with moving and maintaining contact between units. Divisions can move cross-country slowly, but concentrating forces requires aggressive reconnaissance, meticulous intelligence collection, and detailed coordination. More commonly, large forces operate along roads or natural avenues of approach. Patrolling and other surveillance operations are especially important to ensure the security of larger forces in the jungle's restricted and close terrain.

2-3. Commanders recognize that the factors influencing their area of operations (AO) may originate well beyond its geographic boundaries. Given the harsh environment, jungles are often viewed as isolated areas; however, LOCs, such as rivers, and information networks, like the radio and the internet, facilitate the exchange of ideas and resources in even the most remote jungles. Furthermore, some jungles contain vital natural resources over which governments, international organizations, and private industries vie for control. As such, commanders assess the eight interrelated operational variables when conducting jungle operations. Operational variables describe not only the military aspects of an operational environment, but also the population's influence on it. Commanders assess the political, military, economic, social, information, infrastructure, physical environment, and time (known as PMESII-PT) characteristics of the AO and their effects on friendly, enemy, and neutral actors in the region. An accurate understanding of the operational environment enables commanders to build an operational framework for cohesive and effective jungle operations.

OPERATIONAL FRAMEWORK

2-4. An operational framework is a cognitive tool that commanders and staffs use to visualize and describe the application of combat power in time, space, purpose, and resources as they develop the concept of operations. The operational frameworks organize forces geographically (deep, close, rear, support, and consolidation areas), by purpose (decisive, shaping, and sustaining operations), and by effort (main and supporting). Commanders may use any combination of these operational frameworks as they develop their concept of operations. However, higher echelons typically employ a more robust operational framework that depicts combat power geographically, by purpose, and by effort. There is no change to the operational framework for jungle operations.

2-5. Commanders assign subordinates responsibility for particular areas to maintain unity of command, create freedom of action, generate rapid tempo, and best use available combat power. Some capabilities, like cyberspace and information operations, can potentially generate effects far outside assigned AOs for tactical units. As such, retaining the capabilities and the authority for their employment at higher echelons frees subordinate leaders to focus on the demanding aspects of close combat.

NONLINEAR OPERATIONS

2-6. Because jungle operations focus on the enemy and are less concerned with terrain, they are often nonlinear in nature. Characterized by a combination of dispersion and concentration, jungle operations often consist of small units conducting reconnaissance operations and movements to contact to locate and fix the enemy. Forces are then concentrated at decisive points to destroy the enemy and exploit initial success. In nonlinear operations, forces orient on objectives without geographic reference to adjacent forces. Nonlinear operations typically focus on creating specific effects on multiple decisive points. Nonlinear operations emphasize simultaneous operations along multiple lines of effort/lines of operation from selected bases.

2-7. Although jungle operations are often nonlinear, AOs may be either contiguous or noncontiguous. In contiguous AOs, adjacent subordinate command's AOs share a geographic boundary. In noncontiguous AOs, subordinate commands are assigned AOs that do not share geographic boundaries. The higher headquarters retains responsibility for the portion of its operational area not assigned to subordinate units.

DEEP, CLOSE, REAR, SUPPORT, AND CONSOLIDATION AREAS

2-8. Within their assigned AOs, commanders designate deep, close, rear, support, and consolidation areas to describe the physical arrangement of forces in time, space, and focus. Commanders typically use this operational framework at the division and above as lower echelons lack the capabilities to control operations in a deep area.

Deep Area

2-9. A *deep area* is where the commander sets conditions for future success in close combat (ADP 3-0). Operations in the deep area involve efforts to prevent uncommitted or out-of-contact enemy maneuver forces from being committed in a coherent manner or preventing enemy enabling capabilities, such as fires and air defense, from creating effects in the close area. A commander's deep area generally extends beyond subordinate unit boundaries and to the limits of the commander's designated AO. Commanders use operations in the deep area to set conditions for success in the close area or to establish conditions for future operations. In doing so, deep operations can enable friendly forces to choose the time, place, and method for close operations. Operations in the deep area help locate the enemy, restrict their freedom of action, disrupt the coherence and tempo of their operations, interdict their supplies, isolate or destroy their forces, disrupt the movement of operational reserves, or prevent an enemy from employing long-range cannon, rocket, or missile fires. Planning for operations in the deep area includes considerations for information collection, airspace control, joint fires, obstacle emplacement, maneuver (air and ground), special operations, and information operations.

2-10. The jungle's often dense foliage and restricted terrain inhibits the use and effects of conventional capabilities in the deep area. Information collection, joint fires, obstacle emplacement, and maneuver may prove particularly challenging. In these circumstances, commanders may employ special operations forces

specially trained and equipped for jungle operations. However, the lack of cleared areas for drop zones (known as DZs) or landing zones (known as LZs) may limit the use of aviation assets for air assault and resupply operations in the deep area.

Close Area

2-11. The *close area* is the portion of the commander's area of operations where the majority of subordinate maneuver forces conduct close combat (ADP 3-0). Commanders plan to conduct decisive operations using maneuver and fires in the close area, and they position most of the maneuver force within it. Within the close area, one unit may conduct the decisive operation while others conduct shaping operations to fix a specific enemy formation or reduce remnants of by-passed or defeated forces. Operations in the close area require speed and mobility to rapidly concentrate overwhelming combat power at the right time and place to exploit success. Planning for operations in the close area includes fire control measures, movement control measures, and obstacle emplacement. Operations in the close area are inherently lethal because they often involve direct fire engagements with enemy forces seeking to mass direct, indirect, and aerial fires against friendly forces. Dismounted forces are best suited for movement and maneuver during close area operations in dense jungle terrain, while mounted forces are best suited for the open savanna. Each type of force presents unique sustainment challenges requiring extensive planning.

Rear Area

2-12. The rear area is that area within a unit's AO extending forward from its rear boundary to the rear boundary of the area assigned to the next lower level of command. The preponderance of forces in the rear area support and sustain forces in the close area. Given the tendency for jungle operations to occur on non-contiguous battlefields, commanders recognize that close combat is possible in the rear area. This is especially true when facing insurgents or guerrillas as these forces may infiltrate the rear area to conduct raids or other attacks against vulnerable infrastructure and support units. Rear operations include—

- Security.
- Sustainment.
- Terrain management.
- Movement control.
- Protection.
- Infrastructure development.

2-13. Marine Corps formations utilize rear area operations to enhance a force's freedom of action and extend the force's operation reach both in time and space. Rear area operations are synonymous with sustaining actions that seek uninterrupted support to the force. The primary focus of rear area operations during the offensive is to maintain momentum and prevent culminating points.

Support Area

2-14. Commanders designate support areas within the rear area. The *support area* is the portion of the commander's area of operations that is designated to facilitate the positioning, employment, and protection of base sustainment assets required to sustain, enable, and control operations (ADP 3-0). Most of the echelon's sustainment capabilities originate in this area and include LOCs and base clusters. The support area is generally assigned to a maneuver enhancement brigade that provides area security, terrain management, movement control, mobility support, and clearance of fires. This allows sustainment units to focus on their primary functions. The challenges of supporting jungle operations makes protecting the support area vitally important.

Consolidation Area

2-15. The *consolidation area* is the portion of the land commander's area of operations that may be designated to facilitate freedom of action, consolidate gains through decisive action, and set conditions to transition the area of operations to follow on forces or other legitimate authorities (ADP 3-0). Commanders establish a consolidation area, particularly in the offense as the friendly force gains territory, to exploit tactical success while enabling freedom of action for forces operating in the other areas. Consolidation areas in jungle

environments are often noncontiguous since population centers tend to be relatively isolated from one another; consolidating gains in sparsely populated areas requires forces with significant mobility.

DECISIVE, SHAPING, AND SUSTAINING OPERATIONS

2-16. The decisive, shaping, and sustaining framework lends itself to a broad conceptual orientation of the operation. When used with the other frameworks, it provides a greater understanding of the mission's purpose. A *decisive operation* is the operation that directly accomplishes the mission (ADP 3-0). It determines the outcome of a major operation, battle, or engagement. The decisive operation is the focal point around which commanders design an entire operation. Commanders typically identify a single decisive operation, but more than one subordinate unit may play a role in a decisive operation.

2-17. A *shaping operation* is an operation at any echelon that creates and preserves conditions for success of the decisive operation through effects on the enemy, other actors, and the terrain (ADP 3-0). Shaping operations may occur throughout an AO and involve any combination of forces and capabilities. Shaping operations set conditions for the success of the decisive operation by preparing and isolating the battlefield, disrupting the enemy's ability to synchronize forces, deceiving the enemy, and delaying the entry of enemy reinforcements to the main battle area. They also set conditions for the success of subordinate echelons by enabling their freedom of action. Operations across multiple domains, such as space and cyberspace, and operations to inform or deceive a target audience, further illustrate shaping operations. Given the limited resources and harsh environment, shaping operations executed on a noncontiguous jungle battlefield may seek to isolate the enemy from its sources of sustainment or base of support. Commanders may designate more than one shaping operation.

2-18. A *sustaining operation* is an operation at any echelon that enables the decisive operation or shaping operations by generating and maintaining combat power (ADP 3-0). Sustaining operations differ from decisive and shaping operations in that they focus internally (on friendly forces) rather than externally (on enemy forces or the environment). While sustaining operations are inseparable from decisive and shaping operations, they are not usually decisive themselves. Sustaining operations occur throughout an AO, not just within a support area. Sustaining operations determine tempo and operational reach while also setting conditions for future operations. Inadequate sustaining operations or a shift in the priority for sustainment will result in forces reaching their culminating point. The *culminating point* is the point at which a force no longer has the capability to continue its form of operations, offense or defense (JP 5-0). Units in danger of prematurely reaching their culminating point may require an operational pause to allow additional sustaining operations.

2-19. Sustaining operations in the jungle may require unique methods and means of supporting the force. With limited LOCs and restricted terrain, aerial resupply may be the only method of sustainment during emergencies. Planners must improvise and adapt modes of sustainment to those best suited to the environment. This may require operational contract support or other locally derived methods of sustainment such as the use of pack animals or porters.

MAIN AND SUPPORTING EFFORTS

2-20. Commanders designate main and supporting efforts to establish clear priorities of support and resources among subordinate units. The *main effort* is a designated subordinate unit whose mission at a given point in time is most critical to overall mission success (ADP 3-0). The *main effort* is the designated subordinate unit whose mission at a given point in time is most critical to overall mission success. It is usually weighted with the preponderance of combat power and is directed against a center of gravity through a critical vulnerability (MCRP 1-10.2). Typically, commanders shift the main effort one or more times during execution. Designating a main effort temporarily prioritizes resource allocation. When commanders designate a unit as the main effort, it receives priority of support and resources in order to maximize combat power. Commanders establish clear priorities of support, and they shift resources and priorities to the main effort as circumstances and the commander's intent require.

2-21. Commanders may designate a unit conducting a shaping operation as the main effort until the decisive operation commences. However, the unit with primary responsibility for the decisive operation then becomes the main effort upon the execution of the decisive operation.

2-22. A *supporting effort* is a designated subordinate unit with a mission that supports the success of the main effort (ADP 3-0). A *supporting effort* is designated subordinate unit(s) whose mission is designed to directly contribute to the success of the main effort (MCRP 1-10.2). Commanders resource supporting efforts with the minimum assets necessary to accomplish the mission.

MULTIPLE DOMAIN OPERATIONS IN AN EXTENDED JUNGLE BATTLEFIELD

2-23. Jungle operations are influenced by and conducted across the air, land, maritime, space, and cyberspace domains and the information environment. Commanders and staffs must understand the interrelated nature of these domains and both friendly and enemy capabilities in each. From this understanding, commanders can better identify windows of opportunity to converge capabilities for the best effect. Since many cross-domain capabilities are not organic to Army/Marine Corps forces, commanders and staffs plan, coordinate, and integrate joint and other unified action partner capabilities across the range of military operations.

SPACE DOMAIN

2-24. The *space domain* is the area above the altitude where atmospheric effects on airborne objects become negligible (JP 3-14). Army/Marine Corps forces rely on space-based capabilities for information collection; early warning; environmental monitoring; satellite-based communications; and positioning, navigation, and timing. Activities in the space domain enable freedom of action for operations in all other domains, and operations in other domains can create effects in and through the space domain. Effective multiple domain operations require commanders understand the various space-based capabilities and coordinate activities among involved agencies and organizations.

2-25. Declining costs, rapid information exchange, and the ease of global trade have led to the proliferation of advanced space technologies. Adversaries armed with space capabilities can potentially disrupt or defeat Army/Marine Corps forces operating in other domains. A degraded space operational environment inhibits identifying and tracking enemy forces. In the jungle this equates to a loss in efficiency and tempo, since units have to devote more resources to reconnaissance and surveillance. The restricted terrain and dense foliage present in many jungles also inhibits signals' line of sight communications leaving units to rely on space-based assets for command, control, and communications. Without this ability, units may lose their freedom of action and commanders may be unable to synchronize operations in time and space at the speed necessary for successful multiple domain operations. The loss of positioning, navigation, and timing significantly hinders operations in jungles where limited visibility, few landmarks, and complicated terrain make navigation difficult.

2-26. Effective commanders leverage space-based capabilities to converge effects at the appropriate time and location during jungle operations. They recognize what resources are available, who holds the relevant authorities for use, and what coordination leaders need to draw on these cross-domain capabilities. Commanders incorporate space-based effects during planning but ensure an operation's success does not rest solely on them. Commanders conducting jungle operations also prepare for a denied, degraded, and disrupted space operational environment. They employ redundant methods for command, control, and communications. Small units build standard operating procedures (SOPs) that ensure proficiency without depending too heavily on space capabilities. Leaders and Soldiers/Marines train on individual tasks and drills, such as land navigation and call for fire, with methods that are not contingent on space-based assets. Approaching space in this manner ensures that space-based effects enhance jungle operations and multiply combat power without jeopardizing the mission. (See FM 3-14 for more information on Army space operations.)

INFORMATION ENVIRONMENT

2-27. The *information environment* is the aggregate of individuals, organizations, and systems that collect, process, disseminate, or act on information (JP 3-13). The information environment is not separate or distinct from the jungle environment but is inextricably part of it. Any activity that occurs in the information environment simultaneously occurs in and affects one or more of the physical domains.

2-28. The information environment is composed of three dimensions: physical, informational, and cognitive. The physical dimension includes the connective infrastructure that supports the transmission, reception, and storage of information. The informational dimension contains the content (or data), such as text or images, that staffs can collect, process, analyze, store, and disseminate. The informational dimension provides the necessary link between the physical and cognitive dimensions. The cognitive dimension refers to the minds of those who are affected by and act upon information. This dimension focuses on the societal, cultural, religious, and historical contexts that influence the perceptions of those producing the information and of the targets and audiences receiving the information.

2-29. Across the globe, information is increasingly available in near-real time. The ability to access this information, from anywhere, at any time, broadens and accelerates human interaction across multiple levels, including person to person, person to organization, person to government, and government to government. Social media, in particular, enables the swift mobilization of people and resources around ideas and causes, even before they are fully understood. From a military standpoint, information enables decision making, leadership, and combat power; it is also key to seizing, gaining, and retaining the initiative, and to consolidating gains in the jungle environment.

CYBERSPACE AND THE ELECTROMAGNETIC SPECTRUM

2-30. *Cyberspace* is a global domain within the information environment consisting of the interdependent networks of information technology infrastructures and resident data, including the Internet, telecommunications networks, computer systems, and embedded processors and controllers (JP 3-12). Friendly, enemy, adversary, and host-nation networks, communications systems, computers, cellular phone systems, social media, and technical infrastructures are all part of cyberspace.

2-31. Cyberspace is an extensive and complex global network of wired and wireless links connecting nodes that permeate every domain. Networks cross geographic and political boundaries connecting individuals, organizations, and systems around the world. Cyberspace is socially enabling, allowing interactivity among individuals, groups, organizations, and nation-states. Cyberspace is described in terms of three layers:

- Physical network layer—geographic locations in air, land, maritime, or space in which elements of the network reside.
- Logical network layer—components of the network related to one another in a way abstracted from the physical network, based on the logic programming (code) that drives network components.
- Cyber-persona layer—digital representations of individuals or entities in cyberspace.

2-32. Cyberspace is highly vulnerable for several reasons, including ease of access, network and software complexity, lack of security considerations in network design and software development, and inappropriate user activity. An individual or group can easily access cyberspace with a networked device, and an individual with a single device may disable an entire network. Vulnerabilities in the systems that operate in cyberspace contribute to a continuous obligation to manage risk and protect portions of cyberspace.

2-33. The electromagnetic spectrum (EMS) is the range of frequencies of electromagnetic radiation from zero to infinity. It is divided into 26 alphabetically designated bands. The EMS crosses all domains and provides a vital link between the space and cyberspace domains.

2-34. Space and cyberspace operations are mutually dependent, and both rely on the EMS for command and control. Space operations depend on the EMS for the transfer of information and the control of space assets. These space assets then provide the connectivity necessary to operate in cyberspace. When planning cyberspace operations, leaders consider the relationship and dependencies among space, cyberspace, and the EMS, and particularly when conducting targeting in cyberspace. Figure 2-1 displays friendly, threat, and neutral (or non-attributed) networks both within an operational area and worldwide. It depicts the global nature of cyberspace and the extended battlefield.

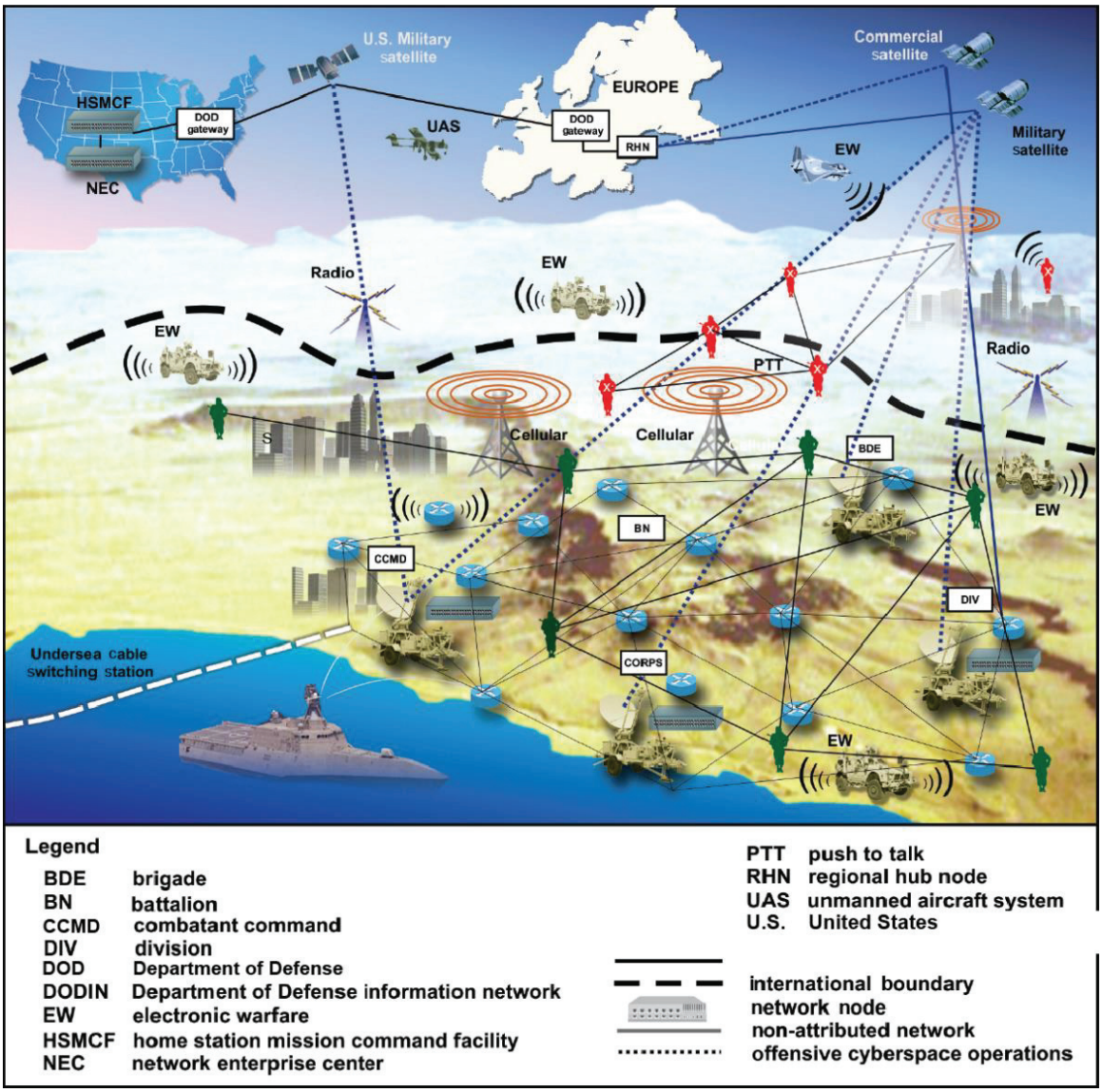


Figure 2-1. Cyberspace in a multiple domain battlefield

2-35. Advantages in cyberspace and the EMS result from effectively synchronizing Department of Defense information network operations, offensive cyberspace operations, defensive cyberspace operations, electronic attack, electronic protection, electronic warfare (EW) support, and spectrum management operations. (See FM 3-12 and MCRP 3-32D.1 [MCWP 3-40.5] for more details on cyberspace effects and electronic attack.)

JOINT OPERATIONS IN A JUNGLE ENVIRONMENT

2-36. Jungle operations require joint capabilities to accomplish missions and achieve objectives across the range of military operations. Jungle operations span from routine military engagement to large-scale combat operations and are executed by a joint task force within a designated joint operations area. The joint force commander (JFC) designates support relationships between major Service or joint commands and joint functional commands. The major land units may include Army forces, Marine Corps forces, or a mixture of both in a joint forces land component command (sometimes called JFLCC). The joint functional commands may include a special operations joint task force, a joint special operations task force, a psychological

operations task force, a civil-military operations task force, and other capabilities based on a situational assessment.

2-37. Through an integrated fires command, many adversaries employ multi-layered, integrated air defense systems and long-range rockets and missiles to execute an anti-access and area denial strategy that challenges the joint force's ability to project combat power into a theater of operations. When combined with limited infrastructure and port facilities, this makes joint forcible entry operations in the jungle particularly challenging. Army/Marine Corps forces help overcome these challenges through a multiple domain approach that includes isolating and neutralizing critical nodes of the enemy's integrated fires command to provide windows of opportunity for joint forcible entry. (See JP 3-18 for more information on joint forcible entry.)

2-38. Once allocated forces arrive in theater during contingency operations, they will operate within a larger joint, intergovernmental, interagency, and multinational organization. To facilitate this transition, commanders leverage special operations forces (SOF), Department of State, and theater resources to build their intelligence picture and understanding of an operational environment. In jungle regions, the lack of a U.S. presence or inadequate infrastructure may require national assets and resources to fulfill information requirements and mitigate sustainment shortcomings.

2-39. Having a thorough understanding of the jungle environment greatly assists commanders. It better enables them to develop workable operational approaches and tactical solutions allowing them to drive the operations process. Commanders who make and implement decisions faster, even to a small degree, gain the initiative.

FUNDAMENTALS OF JUNGLE OPERATIONS

2-40. Combat in the jungle is characterized by long periods of developing a situation and looking for the enemy, and short periods of violent, and sometimes unexpected, combat. Operations are often dispersed across wide geographic areas and combat power is only massed at decisive points after locating the enemy. Jungle operations are characterized by—

- Reduced mobility and limited line of sight.
- Short weapon engagement ranges and response times.
- Multiple and simultaneous engagements from different directions and angles.
- Enemy forces occupying fortified positions.

2-41. Although troops conduct jungle operations according to the fundamentals contained in ADP 3-90 and MCWP 3-01, they have special techniques that help to ensure success in the jungle. These techniques account for the restricted maneuver, slow tempo, close combat, and limited visibility commonly found in the jungle. Effective units adapt their tactics and use these characteristics to their advantage when operating in the jungle.

2-42. Short fields of observation and fire, and thick vegetation make maintaining contact with the enemy difficult. The same factors reduce the effectiveness of indirect fire and make jungle combat primarily a fight between infantry forces. Support by air and mechanized forces can be decisive at times but is not always available or effective.

2-43. To fight and win in the jungle, units must—

- Fight for intelligence; conduct aggressive reconnaissance and surveillance operations.
- Leverage combined arms.
- Control the essential.
- Distinguish noncombatants from combatants.

2-44. These fundamentals, when applied by confident and competent leaders, function as guideposts for units operating in the jungle. In addition to these fundamentals, small units must maintain discipline and rely on well-rehearsed tactics, techniques, and procedures (TTP) to be effective in the jungle. Discipline is necessary to combat the complacency inherent in operations characterized by long periods of inactivity punctuated by brief episodes of intense combat. When troops make contact, they can achieve maximum advantage only through aggressive action predicated upon relevant and rehearsed TTP.

2-45. Given the challenges of reconnaissance, limited mobility, and restrictive terrain, jungle operations often involve ambushes, raids, and meeting engagements. Sparsely populated areas and indistinguishable terrain makes fighting for locations less important than defeating enemy forces or influencing the populace. For example, hills in the jungle often prohibit observation and fire because of the dense vegetation and do not always qualify as key terrain; however, given the lack of LOCs, seizing roads, rivers, streams, fording sites, and landing zones may become tactical or operational imperatives.

2-46. The frequency of ambushes, raids, and meeting engagements makes it very important that small units thoroughly rehearse battle drills. In jungle firefights, the side that initiates contact and gains fire superiority in the first few seconds normally has a decisive advantage.

2-47. A unit planning for jungle operations follows the same planning sequence as in any other type of combat operation. In planning the use of available time, leaders consider that many tasks in the jungle take more time than the same tasks in other environments. Because of the difficult terrain, leaders allot more time for movement and establishing security. This means that units may have to begin movements earlier to accomplish their missions within a specified time. In these situations, units must rely on well-rehearsed SOPs, TTP, and battle drills to mitigate the risk of a condensed planning cycle.

2-48. The following considerations impact fire, movement, and maneuver in the jungle:

- Lack of line of sight and clearance may prevent visual contact between units, interlocking fires, and the use of precision guided munitions.
- Overhead vegetation may block mortars, 40 millimeters grenades, and hand grenades.
- Dense vegetation and restricted terrain may limit the effectiveness of grazing or suppressive fire.
- Adjustment of indirect fire support is difficult due to limited visibility and may have to be accomplished by sound.
- Sounds in the jungle do not travel as far; however, the thicker the jungle louder the noise when moving through it. Although dense vegetation muffles sound, thick undergrowth in certain jungles may make it difficult to conceal movement.
- Heat, thick vegetation, and rugged terrain will exhaust troops rapidly, especially those carrying heavy weapons and radios.
- Lack of roads and limited helicopter landing zones will hinder resupply and casualty evacuation requiring forces to carry additional supplies and casualties extended distances.

2-49. Security operations are a critical component of jungle operations. The jungle's dense vegetation, restrictive terrain, and limited LOCs challenge reconnaissance operations and make it difficult for units to accurately assess the enemy's location, disposition, and intentions. Security operations prevent enemy intelligence, surveillance, and reconnaissance assets from determining friendly locations, strengths, and weaknesses. These operations also provide early warning and continuously disrupt enemy attacks. Active security measures include patrols, observation posts, and perimeter security; they reduce the likelihood of a unit being ambushed or attacked by surprise. Active security measures work most effectively when used with passive security measures. Camouflage, odor control, trash control, and noise and light discipline prevent enemy detection. To prevent being tracked by the enemy, troops police trails for trash and avoid locating bivouacs along natural lines of drift.

FIGHT FOR INTELLIGENCE

2-50. Forces prepare to fight for intelligence to answer priority information requirements regarding threat forces both in and out of friendly contact, across the deep, close, support, consolidation, and rear areas. Aggressive reconnaissance and surveillance operations are necessary to overcome the environmental challenges to information collection. Units diligently fight for intelligence to locate the enemy, identify its objectives, and gain the initiative. Fighting for intelligence can be part of a successful intelligence collection effort conducted by manned, unmanned, manned-unmanned teaming, sensors, or collectors across any domain.

2-51. Small unit leaders implement TTP to ensure their forces exploit all encounters with the enemy to further develop the situation. They carefully examine and document abandoned enemy bivouacs to gather as much information as possible. Captured documents, equipment, and weapons may provide information on

the threat, to include its intentions and capabilities. Abandoned foodstuffs may reveal the enemy's logistical and sustainment situation. Even an ammunition crate may yield a lot number and packing date. Units can use this information to trace the country of origin as well as help identify the unit, individuals, or networks responsible for purchasing, transporting, and storing ammunition.

2-52. A scout familiar with the terrain and the enemy can be an extremely valuable asset. Historically, U.S. forces conducting jungle operations have utilized host-nation scouts, attached down to platoon level. These scouts were auxiliaries, paid by the unit they supported from a fund established by higher headquarters for that purpose. Local regulations and command policies provide guidance regarding operations security and authorities to utilize host-nation scouts.

2-53. Thermal optics, IR imaging, NVDs, and ground sensors enable Solders/Marines to better gather information about enemy troop movements in the jungle. Generally radars and photography do not work as effectively because of the concealment afforded by dense foliage.

2-54. The local populace is one of the most valuable sources of information. Whether hostile, friendly, or indifferent, the people can provide information that will help complete the intelligence picture. Community leaders are often familiar with the terrain, activities, and populace and can provide information on outsiders or enemy forces operating in the area. This information is especially helpful during counterinsurgency operations or when combatting a guerrilla force. The local populace may provide information on enemy timelines and patterns, their routes, and locations of weapons or equipment caches.

Reconnaissance

2-55. *Reconnaissance* is a mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or adversary, or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area (JP 2-0). Many offensive operations in the jungle begin as reconnaissance operations because offensive operations often focus on the unit's ability to find the enemy. The excellent concealment found in the jungle enables the enemy to operate unobserved both by day and night. Extensive patrolling enables troops to obtain information on enemy locations, strength, and disposition.

2-56. Units with the capability to conduct reconnaissance should conduct frequent short patrols during the conduct of normal missions. Effective leaders coordinate these patrols with higher and adjacent units. In some situations, reconnaissance may become the primary objective of a major jungle operation.

2-57. Planning for a jungle reconnaissance should be thorough and well-coordinated. Coordination with higher and adjacent headquarters can ensure maximum results from each patrol and eliminate duplication of effort. Each reconnaissance patrol must be prepared to make contact, develop the situation, and report to its controlling headquarters without becoming decisively engaged. (Refer to FM 3-98, FM 3-90-2, MCTP 3-01A [MCWP 3-11.3], and MCRP 2-10A.6 [MCWP 2-25] for further information on reconnaissance fundamentals, methods of reconnaissance, and characteristics of reconnaissance assets.)

Ground Reconnaissance in the Jungle Environment

2-58. Units accomplish ground reconnaissance by means of observation posts and long- or short-range patrols. The value of observation posts is somewhat reduced in the jungle because of the limited visibility; however, their value as listening posts remains relevant for early detection of enemy forces. Observation posts work best when used along trails, roads, and streams to detect enemy movement. Reconnaissance patrols in the jungle are normally squad size. These patrols move in a manner that takes advantage of natural concealment and avoids becoming decisively engaged with the enemy. Aviation assets increase the depth behind enemy lines that units can employ such patrols.

Aerial Reconnaissance in the Jungle Environment

2-59. Units can use aerial reconnaissance to find remote or partially hidden enemy encampments, helicopter landing zones to support operations, as part of military deception operations, or to take advantage of gaps in the jungle canopy. Detailed tactical aerial reconnaissance requires aircraft that can operate at extremely low altitudes and airspeeds to penetrate the dense jungle canopy and collect information below.

Reconnaissance in Force in the Jungle Environment

2-60. A *reconnaissance in force* is a type of reconnaissance operation designed to discover or test the enemy's strength, dispositions, and reactions or to obtain other information (ADP 3-90). A *reconnaissance in force* is a deliberate attack made to obtain information and to locate and test enemy dispositions, strengths, and reactions. It is used when knowledge of the enemy is vague and there is insufficient time or resources to develop the situation (MCRP 1-10.2). The commander conducting the reconnaissance in force will normally organize the unit into a number of reconnoitering forces. These reconnoitering forces conduct movements to contact, hasty or deliberate attacks, raids, reconnaissance, or patrols. Once the unit makes contact with the enemy, the commander can better assess the enemy and its capabilities. The commander must be prepared to exploit success or, if necessary, withdraw the forces.

2-61. A reconnaissance in force is a limited objective operation normally conducted by a battalion-sized or larger task force and assigned when the enemy is operating within a specific area and the commander cannot obtain adequate intelligence by other means. The size of the unit that conducts a reconnaissance in force depends on the nature of the information to acquire and the chance that the reconnoitering force will have to fight on unfavorable terms. When conducting a reconnaissance in force in the jungle, commanders must ensure that subordinate forces can mutually support each other. Jungle terrain has the potential to compartmentalize subordinate units conducting area, zone, and route reconnaissance; if friendly units make contact with an overwhelming enemy force, they risk defeat in detail.

Reconnaissance by Fire in the Jungle Environment

2-62. In reconnaissance by fire, reconnaissance elements place direct or indirect fire on positions where there is a reasonable suspicion of enemy occupation. The elements try to prompt the enemy to react by moving or returning fire and disclose their disposition or willingness to fight. Reconnaissance by fire during jungle operations can confirm the presence of suspected enemy encampments. Units can also use it to support a spoiling attack when they suspect an enemy force of concentrating before a planned offensive operation. Commanders use spoiling attacks to disrupt enemy troop concentrations and attack preparations. Reconnaissance by fire from attack helicopters will often reveal the location of well-concealed enemy troops. When using reconnaissance by fire, commanders consider the rules of engagement (ROE) and the potential for collateral damage. Commanders also accept that reconnaissance by fire jeopardizes the element of surprise for follow-on operations.

Surveillance

2-63. *Surveillance* is the systematic observation of aerospace, cyberspace, surface, or subsurface areas, places, persons, or things by visual, aural, electronic, photographic, or other means (JP 3-0). Marine Corps amplification adds the systematic visual or aural observation of an enemy force or named area of interest or an area and the activities in it to collect intelligence required to confirm or deny enemy/adversary courses of action or identify enemy/adversary critical vulnerabilities and limitations (MCRP 1-10.2). Because of the restrictive terrain and limited mobility, wide area surveillance is often not feasible in the jungle. Instead, commanders conduct surveillance operations to observe and collect information on key points such as trails, streams, and clearings. Commanders usually plan surveillance operations to support other missions.

Ground Surveillance Radars

2-64. Ground surveillance radars are best employed in those jungle areas where vegetation and terrain do not restrict line of sight. Night observation devices are also useful in such areas during periods of darkness. Unattended ground sensors, which are not affected by poor line of sight, prove very useful in watching specific key areas. However, poor weather affects some electronic devices and moving the devices is difficult in thickly forested areas.

Air Surveillance

2-65. Surveillance of jungle areas from the air is most effective when pilots are familiar with ground operations and can recognize changes from normal patterns. Repeated flights by the same crews will attain this level of familiarity. In addition to visual surveillance, photographic coverage of an area assists the

surveillance effort. Side-looking airborne radar works poorly in thick foliage but can be used for surveillance along roads, trails, or streams. Likewise, atmospheric obscuration and vegetation degrades IR detection devices.

LEVERAGE COMBINED ARMS

2-66. While light infantry are the predominant close combat forces in the jungle, the Army/Marine Corps fight as combined arms teams. Fighting as a combined arms team provides U.S. forces with a distinct advantage over the enemy and is critical to achieving and maintaining operational initiative. The effective use of combined arms presents the enemy with multiple dilemmas while affording friendly forces distinct and varied COAs across multiple domains. However, effectively leveraging combined arms capabilities in the jungle requires careful planning and adaptive tactics to mitigate the effects of restrictive terrain and harsh weather.

2-67. An effective combined arms organization ensures that forces are task-organized with infantry, the essential building block for all organizations conducting jungle operations. Infantry protects mounted elements as the combined arms unit moves and maneuvers to accomplish its mission. The infantry destroys the enemy in built-up areas, defensive positions, restricted terrain, or subterranean areas where mounted forces cannot operate. It prevents enemy infiltration into cleared areas by securing consolidation areas.

2-68. Armor elements protect Soldiers/Marines by destroying or suppressing enemy armor or defensive positions with precise fire from maximum possible ranges. The presence of armor and aviation assets can also have a powerful psychological effect, especially against poorly trained or inexperienced enemy forces. During joint operations with Army and Marine Corps forces, the Marine Corps relies on Army forces to provide tank assets; planners coordinate to ensure appropriate assets are available to support Marines as necessary.

2-69. Enablers such as engineers, military police, and chemical units provide assured mobility and countermobility to facilitate movement and maneuver in the close, support, and consolidation areas. Engineer support may be critical to sustaining mobility during periods of heavy precipitation. Units conduct expanded engineer reconnaissance to identify trafficable routes; identify and reduce obstacles or minefields; and construct landing zones, drop zones, and hasty airstrips. Although flat, open areas may exist, engineers may need to stabilize soil and prepare surfaces to support aircraft. Jungle soil generally produces extensive dust when cleared of vegetation and quickly erodes or turns to mud during heavy precipitation.

Armor Operations in the Jungle

2-70. Restrictive terrain and the lack of LOCs can limit armored forces' mobility in the jungle. Their role in the jungle differs from that in more open terrain. Instead of rapid envelopments and deep penetrations, armored forces primarily provide support by fire for infantry in jungle operations. Commanders carefully consider employing armor in the jungle as one of its greatest strengths, mobility, is often compromised in this environment.

2-71. Armored forces are suited to the following tactical tasks in the jungle:

- Support by fire. *Support by fire* is a tactical mission task in which a maneuver force moves to a position where it can engage the enemy by direct fire in support of another maneuvering force (FM 3-90-1). *Support by fire* is to engage the enemy by direct fire to support a maneuvering force using overwatch or by establishing a base of fire. The supporting force does not capture enemy forces or terrain (MCRP 1-10.2).
- Retain key terrain. *Retain* is a tactical mission task in which the commander ensures that a terrain feature controlled by a friendly force remains free of enemy occupation or use (FM 3-90-1). *Retain* is to occupy and hold a terrain feature to ensure it is free of enemy occupation or use (MCRP 1-10.2). Because of their superior firepower and protection, armored forces are well suited to retaining key terrain.
- Destroy or defeat enemy armor.
- Reduce encircled or isolated enemy forces. *Reduce* is a tactical mission task that involves the destruction of an encircled or bypassed enemy force (FM 3-90-1). The Marine Corps does not

consider reduce to be a tactical task. (See MCDP 1-0 for tactical tasks.) Armor, supported by infantry, may be used to reduce an isolated enemy force that has lost its mobility.

- Secure critical facilities or infrastructure. *Secure* is a tactical mission task that involves preventing a unit, facility, or geographical location from being damaged or destroyed as a result of enemy action (FM 3-90-1). *Secure* is to gain possession of a position, terrain feature, piece of infrastructure, or civil asset, with or without force, and prevent its destruction or loss by enemy action. The attacking force may or may not have to physically occupy the area (MCDP 1-0).
- Suppress. *Suppress* is a tactical mission task that results in the temporary degradation of the performance of a force or weapon system below the level needed to accomplish its mission (FM 3-90-1). The Marine Corps describes the task as the transient or temporary degradation of an opposing force or the performance of a weapons system below the level needed to fulfill its mission objectives. (See MCDP 1-0 for tactical task descriptions.) With their superior firepower, armored forces can be used to suppress the enemy during the attack.

Restrictions on Use of Armor

2-72. Use of armor in the jungle is restricted by:

- Vegetation. Densely forested areas, where tree trunks grow close and heavy above-ground root systems exist, limit armored forces' mobility. Thick stands of bamboo may slow or even stop tanks.
- Topography. Many jungles exist in rugged mountainous areas that impede armored forces' mobility. Swamps, coastal river basins, and other areas with high water tables and multiple water ways pose obstacles to tanks because of their soft soil and frequent deep channels.
- Weather. Heavy rain and monsoons cause rivers and streams to rise and become unfordable. They also saturate the soil and damage roads, leaving both improved and unimproved LOCs impassable for armor.

Overcoming Armor Restrictions

2-73. Although limited, tanks are not precluded from jungle operations, and restrictions can be mitigated by adhering to the following principles:

- Know the terrain. Know where tanks can travel and avoid areas obviously impassable.
- Know the weather. Know the recent conditions. Know the forecast. Know the effects these conditions have on armored vehicles.
- Move dismounted infantry in front of armored forces through unfamiliar and densely forested terrain. They can check and verify conditions, act as guides, and provide security.

Tips for Armor Movement in the Jungle

2-74. Jungle conditions vary greatly from place to place and season to season. Some movement tips that apply to most jungle areas:

- Red silt soils tend to break down quickly when wet. They may support a single tracked vehicle but become impassable with heavy use.
- Streams and creeks that appear fordable but contain yellowish reeds and cloudy water usually have bottoms too soft to support tanks.
- Rice paddies in the dry season are usually trafficable to tanks and personnel carriers. However, during the rainy season, they often become impassable. Fields with standing water in the wet season may have a bottom too soft to move on; those containing clear water and green vegetation are usually firm enough for armored forces. To determine if vehicles can travel through rice paddies, troops can "pole" the area. Using this technique, troops precede tanks across the field, sinking poles (1 to 1.5 inches [2.5 to 3 centimeters] in diameter, with flat ends) into the ground. If the poles cannot be sunk, the vehicles usually can cross the field.
- River and stream bottoms are usually impassable. The armored vehicle launched bridge can span 57 feet (17 meters) (with unprepared abutments) and the rapidly emplaced bridge system used by Strykers can span a 42-foot (12-meter) unprepared gap. Both are more than adequate for most

streams encountered in the jungle. Troops ensure that the bank shoulders can support the bridge while tanks cross. When units do not have a bridge, they can use perforated steel planks to provide a firm surface on which tanks can ford small streams.

Mechanized Infantry Operations in the Jungle

2-75. Mechanized infantry offer commanders additional options for jungle operations. Tasks that mechanized infantry units are most likely to conduct in a jungle environment include movement to contact and reconnaissance in force. *Movement to contact* is a type of offensive operation designed to develop the situation and establish or regain contact (ADP 3-90).

2-76. Hasty and deliberate attacks conducted in the jungle adhere to the same principles as those conducted on less restrictive terrain; however, techniques, scope, and control measures may differ due to the terrain and visibility restrictions. Attacks in the jungle normally occur on a narrower front, and because of this restrictive control measures may be necessary to prevent fratricide and carefully control movement.

Considerations for Employment

2-77. Commanders may use mechanized infantry in different ways, so they must weigh the precise mission it is assigned against its strengths and weaknesses in a jungle environment (much like armor units).

2-78. The advantages of using mechanized infantry in the jungle include—

- Quick reaction over distances. Mechanized infantry has its own transportation immediately available and considerable firepower to accompany it. In savanna, or on firm but lightly vegetated ground, mechanized infantry (and armor) can move considerable distances in a relatively short time.
- Firepower. A mechanized force has greater firepower than dismounted or light infantry units. Mechanized infantry units are equipped with the Bradley fighting vehicle. The Bradley fighting vehicle's 25mm main gun (capable of firing high-explosive or armor-piercing rounds), co-axial mounted 7.62mm machine gun, and tube launched, optically tracked, wire guided anti-tank missiles can be used to strengthen defenses or provide overmatching direct fire.
- Large load capacity. The Bradley fighting vehicle provides mechanized infantry units with a larger capacity to carry food, water, and ammunition than other infantry units.
- Command, control, and communications. Mechanized infantry possesses a wider array of command and control systems than dismounted forces. In addition to various radios, mechanized infantry commanders have access to command and control systems, such as Blue Force Tracker, that enable a better understanding of current operations and provide greater control.
- Optics. Mechanized infantry vehicles are equipped with advanced optics systems capable of penetrating dense jungle foliage and providing lethal and accurate direct fire.

2-79. Disadvantages of mechanized infantry in the jungle environment include—

- Mobility. When used as a mounted force, mechanized infantry units (as well as armor units) may be limited in the scope of their operations by the terrain in which they are employed.
- Noise. The noise generated by tracked vehicles often prevents mechanized infantry units from achieving surprise.
- Logistics requirements. Mechanized infantry units (as with armor units) have a significant logistics requirement because of increased petroleum, oils, and lubricants (known as POL) consumption; greater repair parts requirements; more frequent recovery operations; and larger maintenance demands.

Mounted Movement

2-80. When moving in the jungle, troops ideally move in multiple columns on as broad a front as possible with support ready nearby. An aerial route reconnaissance precedes the lead elements. Leaders closely coordinate indirect fire support so it is rapidly available, since contact is often violent and without warning. Close air support (CAS) and attack aviation provide other responsive means to react to enemy contact.

The Amphibious Assault Vehicle and Amphibious Combat Vehicle

2-81. Marine Corps units equipped with either the amphibious assault vehicle (AAV) or amphibious combat vehicle (ACV) possess additional mobility capabilities in the jungle as both amphibious vehicles can be used to swim rivers or water obstacles that are too deep to ford. The AAV is a fully tracked troop carrier armed with a MK-19 40mm grenade launcher and M-2 .50 caliber machine gun. The ACV is a wheeled amphibious vehicle with a three-Marine crew capable of carrying approximately 10 to 13 Marines. Like the AAV, it is armed with a MK-19 and an M-2 machine gun. Variants of the ACV include a command and control vehicle and a version armed with a 30mm cannon.

The Stryker/Light Armored Vehicle

2-82. Infantry units equipped with the Stryker/light armored vehicle (LAV) can conduct jungle operations. The Stryker/LAV is lighter, faster, and more mobile than tracked armored forces, and possesses significant firepower. The Stryker is equipped with a MK-19 40mm automatic grenade launcher, a M2 .50 caliber machine gun, and, in certain configurations, a 105mm M68A2 main gun, or a 30mm Mk44 Bushmaster cannon. The LAV is equipped with a M242 Bushmaster 25mm cannon and two M240 7.62mm machine guns. In the jungle, commanders often use Stryker/LAV-equipped units to conduct movement to contacts. After a dismounted force makes contact with the enemy, the Stryker/LAV provides support by fire. Commanders employing the Stryker/LAV in the jungle consider the following:

- The Stryker/LAV is lighter than most tracked vehicles and capable of operating on softer or more saturated soils. The Stryker/LAV can operate in 8x8 wheel drive; however, this increases fuel consumption.
- Certain variants of the LAV can swim across water obstacles; however, commanders and operators must consult the appropriate technical manuals to ensure their specific model can perform this function and that the water current is within acceptable standards.
- Dense jungle foliage and restrictive terrain often prevent employing Stryker/LAV weapons at their maximum effective ranges; thereby, negating their perceived firepower advantage.

CONTROL THE ESSENTIAL

2-83. Most jungle areas are too large to be completely occupied or effectively controlled in whole. Army/Marine Corps forces instead focus their efforts on controlling only the essentials for mission accomplishment. At a minimum, this requires control of key terrain. In the jungle, commanders determine key terrain based on its functional, political, economic, or social significance. A bridge, waterway, power station, natural resource, or a place of worship may be key terrain. (See paragraph 1-40 for key terrain definition.)

2-84. Although all principles of joint operations apply to jungle operations, due to the dispersed nature of jungle operations, commanders must carefully balance the principles of mass and economy of force. To deploy the combat power required to locate the enemy, commanders conduct economy of force operations elsewhere. Because of this, they carefully assume risk in those areas they choose not to control. However, commanders must retain the ability to mass combat power once troops locate the enemy. Only controlling requirements essential for mission success preserves combat power and enables the massing of forces and effects at decisive points.

2-85. Host-nation forces, paramilitary organizations, or friendly guerrillas may offer a means for commanders to balance economy of force with the need to mass combat power. As force multipliers, these partners can control requirements deemed important, yet not essential, to jungle operations. However, when relying on these forces, commanders must maintain communications and liaison to ensure mutual support and coordination. SOF are trained and equipped to work closely with host-nation forces in this capacity.

DISTINGUISH NONCOMBATANTS FROM COMBATANTS

2-86. Despite appearing to be sparsely populated, a variety of indigenous populations—both combatants and noncombatants—inhabit jungles. Recognizing this, commanders rely on the principle of restraint to limit collateral damage and prevent the unnecessary use of force. Commanders exercise discretion with direct and indirect fires, ensuring troops clearly identify and confirm targets as legitimate military targets.

Indiscriminate fires into areas assumed to be uninhabited or only inhabited by enemy forces may result in collateral damage that significantly hinders the operation. Commanders make every effort to distinguish between combatants and noncombatants.

2-87. Because jungle combat is primarily conducted by dismounted infantry, guerrillas, or insurgents, distinguishing between combatants and noncombatants is particularly challenging. Light forces, unencumbered by heavy vehicles, equipment, and supply trains can more easily blend in with noncombatants and hide among the populace. Enemy forces can easily cache light weapons and munitions until needed for operations, enabling them to move freely among the populace and making it more difficult for U.S. forces to identify them. Recognizing that U.S. forces strictly adhere to the law of war, this tactic may embolden enemy forces who feel confident they are safe among the populace. Soldiers/Marines operating in these conditions make every effort to discriminate between combatants and noncombatants. They exercise restraint and demonstrate the highest level of individual and organizational discipline and judgment. Soldiers/Marines must possess the maturity to direct their aggression towards the enemy and refrain from directing it at noncombatants. Command emphasis, leadership, and training are critical since failing to distinguish between combatant and noncombatants may strongly impact national and international perceptions of the operation.

2-88. When distinguishing between combatants and noncombatants, commanders carefully consider whether to physically relocate noncombatants. Historical attempts to separate combatants from noncombatants by physically relocating noncombatant populations have met with limited success and often foster resentment among the civilian populace. Instead, commanders make efforts to frequently visit and, if possible, secure villages, towns, and other civilian areas. This approach is more likely to build rapport and trust with the civilian populace who, in turn, is more likely to reject the enemy's efforts to operate freely among them.

Chapter 3

Combat Power in Jungle Regions

Projecting combat power in the jungle requires a combination of unique methods and determined leadership. This chapter provides tactics, techniques, and procedures to enhance the survivability and effectiveness of forces operating across the competition continuum in an austere and demanding environment. Through the elements of combat power, it describes how units adapt operations to achieve a decisive edge over the enemy.

COMBAT POWER

3-1. *Combat power* is the total means of destructive and/or disruptive force that a military unit/formation can apply against the opponent at a given time (JP 3-0). The Army defines *combat power* as the total means of destructive, constructive, and information capabilities that a military unit or formation can apply at a given time (ADP 3-0). The Marine Corps adds that combat power is the total destructive force brought to bear against the enemy; it is a unique product of a variety of physical, moral, and mental factors. (For more on combat power, see MCDP 1-3.)

3-2. The Army describes combat power using eight elements: leadership, information, command and control, movement and maneuver, intelligence, fires, sustainment, and protection. Combat power is not a numerical value, but it can be estimated and is always relative to an enemy. Before an operation, combat power is unrealized potential. The Army classifies six elements of combat power as warfighting functions: command and control, movement and maneuver, intelligence, fires, sustainment, and protection. The Marine Corps recognizes information as a seventh warfighting function. A *warfighting function* is a group of tasks and systems united by a common purpose that commanders use to accomplish missions and training objectives (ADP 3-0). (See ADP 3-0 and FM 3-0 for more information on the application of combat power through the warfighting functions using leadership and information to achieve unity of effort. Marines see MCDP 1-0 and MCDP 1-3 for more information on the concentration of combat power toward the main effort and the acceptance of prudent risk.)

LEADERSHIP

3-3. Commanders apply leadership through mission command. Through leadership, the unrealized potential of combat power is transformed into action. *Leadership* is the activity of influencing people by providing purpose, direction, and motivation to accomplish the mission and improve the organization (ADP 6-22). Leadership is also the multiplying and unifying element of combat power. Confident, competent, and informed leadership intensifies the effectiveness of all other elements of combat power by formulating sound operational ideas and instilling discipline and motivation in the force. Good leaders are the catalyst for success. Effective leadership can compensate for deficiencies in all the warfighting functions because it is the most dynamic element of combat power. The opposite is also true; counterproductive leadership can negate advantages in warfighting capabilities. (For more discussions on leadership, refer to ADP 6-22, MCDP 1, MCWP 6-10 [MCWP 6-11], and FM 6-22.)

3-4. Leadership ensures Soldiers/Marines understand the purpose of operations and use their full capabilities. In every operation, leaders clarify purpose and mission, direct operations, and set the example for courage and competence. They hold their Soldiers/Marines to the Army/Marine Corps Values and ensure they comply with the law of war. Marines can see MCWP 6-10 (MCWP 6-11) for detailed information on the Marine Corps Values.

3-5. Confident, competent, and engaged leaders are critical to successful jungle operations. Effective leaders combat the complacency and fatigue inherent in operations characterized by long periods of inactivity punctuated by unexpected and violent engagements. They maintain the health, welfare, and morale of their Soldiers/Marines through communications, engagement, and discipline. Leaders listen to their Soldiers/Marines' concerns and keep them informed as the situation changes. They share in the privations of jungle combat and ensure their subordinates adhere to the practices necessary to remain effective in this harsh environment.

3-6. Commanders and leaders cannot allow their leadership responsibilities to impede on their ability to care for themselves. The jungle's harsh environment exacts the same toll on leaders as it does their subordinates, and leaders are equally as susceptible to fatigue, dehydration, and heat injury as those they lead. However, the consequences of a fatigued or incapacitated leader can be far more devastating than a fatigued or incapacitated Soldier/Marine. Tasks requiring quick reaction, complex reasoning, and detailed planning require leaders with high cognitive function. Leaders do not prove their mettle by working longer hours or by performing more arduous tasks than their subordinates. Effective leaders trust their subordinates, manage their time, and properly delegate tasks across the organization to maintain an efficient and effective fighting force.

3-7. Peer leaders at echelon closely monitor each other for signs and symptoms of fatigue, dehydration, illness, or heat injury. Platoon sergeants and platoon leaders/commanders, company commanders and first sergeants, and battalion commanders and command sergeants majors all look out for each other and ensure their counterparts are exercising sound judgment in caring for themselves. They ensure that leaders, as well as their Soldiers/Marines, adhere to the appropriate work/rest cycle. They intervene early when they suspect that their counterpart is jeopardizing their health, safety, or effectiveness.

INFORMATION

3-8. Every engagement, battle, and major operation requires complementary information operations to both inform a global audience and to influence audiences within an operational area. Information is a weapon against enemy command and control and a means to affect enemy morale. It is both destructive and constructive. Commanders use information to understand, visualize, describe, and direct the warfighting functions. Soldiers/Marines constantly use information to persuade and inform target audiences. During large-scale combat operations, the JFC can create a joint military information support task force to serve as the principal organization responsible for information operations in the joint operations area. The Army's contribution to information operations during large-scale combat is the military information support group. The Army assigns one military information support group to the Active Component and three military information support groups to the Reserve Component.

INFORMATION WARFIGHTING FUNCTION

3-9. The information warfighting function consists of the management and application of information and its deliberate integration with the other warfighting functions to influence relevant actor perceptions, behavior, action or inaction, and support human and automated decision making. The information warfighting function helps commanders and staffs understand and leverage the pervasive nature of information, its military uses, and its application across all operational phases and the range of military operations. The information warfighting function integrates, protects, and preserves friendly information while leveraging the informational effects of military activities to achieve objectives.

3-10. Although the jungle often lacks robust information infrastructure, information operations remain a relevant way to shape conditions for future operations and influence friendly, enemy, and neutral audiences. During jungle operations, information collection and exchange may be most effective through small unit and key leader engagements. However, the foundation of effective information operations requires recognizing that actions are more powerful than words, and Marines must consider how their activities affect the information environment when they plan and assess information operations. Commanders recognize that deliberate information operations often have significant constraints, restraints, and approval authority withheld at a higher echelon. Because of this, commanders and staff plan information operations in advance

to ensure Marines have adequate time to receive the necessary approval and deliver effects in the information environment when needed.

3-11. While the actions of all Marines can influence the information environment, the primary organization charged with executing deliberate information operations is the Marine Expeditionary Force Information Group (known as MIG). This group coordinates, integrates, and employs information warfare capabilities to ensure friendly force maneuver and deny the enemy freedom of action in the information environment. The Marine Expeditionary Force Information Group contains a communications battalion with a defensive cyberspace operations company and a radio battalion with an information warfare company. (For more information on information operations, see MCWP 3-32 [MCWP 3-40.4].)

COMMAND AND CONTROL WARFIGHTING FUNCTION

3-12. *Command and control* is the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission (JP 1). The Marine Corps amplification adds the means by which a commander recognizes what needs to be done and sees to it that appropriate actions are taken. Command and control is one of the warfighting functions (MCRP 1-10.2).The *command and control warfighting function* is the related tasks and a system that enable commanders to synchronize and converge all elements of combat power (ADP 3-0). The primary purpose of the command and control warfighting function is to assist commanders in integrating the other elements of combat power (movement and maneuver/maneuver, intelligence, fires, sustainment/logistics, protection, information, and leadership). *Mission command* is the Army's approach to command and control that empowers subordinate decision making and decentralized execution appropriate to the situation (ADP 6-0). Command and control are interrelated. Command resides with commanders and includes the authority and responsibility for effectively using available resources and for planning the employment, organizing, coordinating, and controlling of military forces for the accomplishment of missions. It includes responsibility for the health, welfare, morale, and discipline of assigned personnel. *Control* is the regulation of forces and warfighting functions to accomplish the mission in accordance with the commander's intent (ADP 6-0). *Control* is to maintain physical influence by occupation or range of weapon systems over the activities or access in a defined area (MCRP 1-10.2).

3-13. Reliable command and control systems are essential in jungle operations. A *command and control system* is the arrangement of people, processes, networks, and command posts that enable commanders to conduct operations (ADP 6-0). Command and control systems enable commanders to communicate information and control forces whether mounted or dismounted and are key enablers of successful operations. Command and control systems facilitate communications across echelons and forces separated by vast distances. Command and control, fire support, resupply, and evacuation all depend on effective communications. Commanders develop a redundant and reliable communications architecture within their command and control system that is capable of functioning in a denied, degraded, and disrupted space operational environment. The command and control system components critical to effective jungle operations include integrating processes; networks, information, and communication systems; and command posts.

INTEGRATING PROCESSES

3-14. Commanders establish and use processes and procedures to organize activities within their headquarters and throughout the force. Commanders and staff use several integrating processes to synchronize specific functions throughout the operations process. Integrating processes include the military decision-making process (MDMP), the Marine Corps planning process (MCPP), intelligence preparation of the battlefield/battlespace (IPB), information collection, targeting, risk management, and knowledge management.

Military Decision-Making Process

3-15. The *military decision-making process* is an iterative planning methodology to understand the situation and mission, develop a course of action, and produce an operation plan or order (ADP 5-0). The MDMP consists of seven steps with inputs, a series of sub-steps, and outputs. It is a collaborative planning process conducted by the commander and staff. Because of the challenges associated with information collection in

the jungle, commanders may have to revisit steps of the MDMP after reconnaissance operations yield information on the enemy situation, disposition, and intent. (For more information on the MDMP see FM 6-0.) The seven steps of the MDMP:

- Step 1 – Receipt of mission.
- Step 2 – Mission analysis.
- Step 3 – COA development.
- Step 4 – COA analysis.
- Step 5 – COA comparison.
- Step 6 – COA approval.
- Step 7 – Orders production, dissemination, and transition.

Marine Corps Planning Process

3-16. The MCPP provides commanders and staffs at all levels a means to organize and plan their activities, to transmit plans to subordinate units, and to share a common understanding of the mission and intent. The MCPP applies across the range of military operations. It applies equally to deliberate planning and continuous planning for ongoing operations. Although listed sequentially, units can conduct the six steps of the MCPP in a different order given the demands and constraints of an operational environment. This is especially true in the jungle, where the intelligence picture is often unclear and logistics considerations can significantly impact operations. The six steps of the MCPP:

- Step 1 - Problem framing.
- Step 2 - COA development.
- Step 3 - COA war game.
- Step 4 - COA comparison and decision.
- Step 5 - Orders development.
- Step 6 - Transition.

Intelligence Preparation of the Battlefield/Battlespace

3-17. *Intelligence preparation of the battlefield* is the systematic process of analyzing the mission variables of enemy, terrain, weather, and civil considerations in an area of interest to determine their effect on operations (ATP 2-01.3). The *intelligence preparation of the battlespace* is the analytical methodologies employed by the Services or joint force component commands to reduce uncertainties concerning the enemy, environment, time, and terrain (JP 2-01.3). The Marine Corps amplification adds the systematic, continuous process of analyzing the threat and environment in a specific geographic area (MCRP 1-10.2). To describe the effects of the environment on operations, commanders and staff develop a modified combined obstacle overlay (MCOO). The *modified combined obstacle overlay* is a joint intelligence preparation of the operational environment product used to portray the militarily significant aspects of the operational environment, such as obstacles restricting military movement, key geography, and military objectives (JP 2-01.3). Staffs use the MCOO when developing and analyzing COAs; it is a critical tool for determining the appropriate force for a given objective. The MCOO is the first step in arranging actions in both space and time to determine feasibility. When developing a MCOO for jungle operations, commanders carefully consider that dismounted forces will likely use mobility corridors and require greater cover and concealment than armored forces. They also recognize that, although mobility corridors may be geographically close to each other, the jungle's restrictive terrain may prevent dismounted forces from rapidly providing mutual support between these corridors. In relatively flat jungles without sharp changes in elevation, staffs carefully plan to confirm that mobility corridors can support movement. Although terrain in these jungles may appear unrestricted on topographic maps, dense vegetation may severely impede movement. As such, commanders and staff use aerial and satellite imagery when available to support the IPB process and develop accurate MCOOs. (For more information on IPB, see ATP 2-01.3.)

Information Collection

3-18. The jungle terrain and weather present significant challenges to information collection. The size of the operational area, trafficability, and severe weather affect when and how assets are deployed and may degrade

sensor capabilities. Although staffs have responsibility for terrain management for asset locations, commanders can mitigate some of the challenges associated with information collection in the jungle. Commanders implement aggressive reconnaissance and surveillance operations and delegate information collection tasks to lower echelons. When assigning information collection tasks to lower echelons, commanders ensure the tasked unit can manage the geographic areas designated for reconnaissance and surveillance. This often requires reducing the size of the zone, area, or route to be reconnoitered. (See FM 3-55 for more information on information collection.)

3-19. Given the challenges to information collection in the jungle, producing an accurate enemy situation template is critical to facilitate effective planning and decision making. A *situation template* is a depiction of assumed adversary dispositions, based on that adversary's preferred method of operations and the impact of the operational environment if the adversary should adopt a particular course of action (JP 2-01.3). Marine Corps amplification is a series of projections that portray, based on enemy doctrine, the most probable disposition and location of enemy forces within constraints imposed by weather and terrain (MCRP 1-10.2). The situation template depicts the most critical point in the operation as agreed upon by the commander, the operations officer, and the intelligence officer. Situational templates address terrain, mobility corridors, artillery range fans, movement times between enemy reserve assembly areas and advancing friendly forces, and other related intelligence variables.

Targeting

3-20. Targeting during jungle operations requires special planning and techniques as restrictive terrain and dense vegetation may degrade or limit target acquisition assets. Collaboration across the entire staff is necessary to develop a targeting plan that accounts for the jungle terrain and its limitations. The fire support officer advises the operations officer on the appropriate munitions and fire support weapons systems for effective fires in the jungle. The intelligence officer and engineer officer advise the operations officer on the environmental considerations and effects of terrain on operations. Often viewed as important natural resources, commanders consider the environmental impacts of engaging targets in the jungle and whether the targeting action will arouse environmental or cultural sensitivities. Sensitive locations or infrastructure are placed on the restricted target list. (See ATP 3-60 for more information on targeting.)

Risk Management During Jungle Operations

3-21. The fourth integrating process commanders use to command and control forces is risk management. *Risk management* is the process to identify, assess, and control risks and make decisions that balance risk cost with mission benefits (JP 3-0). Marine Corps amplification is the five steps of risk management are identify the hazards, assess the hazards, develop controls and make risk decision, implement controls, and supervise and evaluate (MCRP 1-10.2). Commanders consider and balance operational and environmental risks against those risks with mission benefits to determine their operational approach and tactical solutions in the jungle environment in pursuit of their assigned objectives. Commanders consider the following factors when mitigating risk during jungle operations:

- Force strength.
- Force tailoring/task organizing.
- Causalities.
- Collateral damage.
- Fratricide.
- Risk reduction measures.

Force Strength

3-22. When facing prospective jungle operations, commanders consider if they have the necessary troops and capabilities to achieve the commander's intent within acceptable risk. Major jungle operations, particularly large-scale combat, require a significant number of combined arms forces. While operations may not require controlling the entire jungle area, achieving and maintaining relative combat power is critical to successful operations. If commanders lack sufficient forces to conduct effective operations, they must adjust their operational approach accordingly, request the necessary capabilities through the JFC, or do both. In

determining whether they possess adequate force strength, commanders consider the quantity and type of forces required to shape operational environments, prevent conflict, prevail during large-scale combat, and consolidate gains. Commanders must also ensure sufficient sustainment and enabling forces are available to maintain tempo during jungle operations. Commanders who neglect sustainment and enabling forces jeopardize their operational reach and risk early culmination.

Force Tailoring/Task Organizing

3-23. Commanders mitigate risk through careful force tailoring for jungle operations. *Force tailoring* is the process of determining the right mix of forces and the sequence of their deployment in support of a joint force commander (ADP 3-0). As both ready units and transportation assets are limited, commanders must recognize the trade-offs between capabilities and balance the force flow within an acceptable level of risk. For example, commanders who deploy a preponderance of combat forces into theater early in an operation take considerable risk regarding the sustainment and protection of these forces. Conversely, too many sustainment forces without adequate security forces risk defeat by the enemy. As they tailor a force for deployment, commanders assess the environment, the threat, the timeline, and the capability for the designated AO to support U.S. forces. They then identify the appropriate mix of combat forces, sustainment units, protection assets, enablers, and headquarters to meet the JFC's needs. Although there is no single solution to tailoring a force for deployment, many jungles possess limited or unimproved airports, sea ports, or both and require theater opening and sustainment units early in the force flow to set conditions for follow-on combat units.

3-24. Generally, light infantry and SOF, cohesively integrated with aviation, fire support, and engineers, are the most appropriate combat forces for jungle operations. The need to clear enemy forces from the jungle environment, hold hard-won terrain, and interact with the population requires significant dismounted infantry formations. Army/Marine Corps forces conducting jungle operations are tailored to include a larger light infantry component. Additional aviation forces are invaluable for projecting, supporting, and sustaining combat power into areas not accessible by ground due to terrain. SOF's ability to conduct special reconnaissance, preparation of the environment, and direct action make them particularly valuable during jungle operations. SOF include military information support operations (MISO) and civil affairs forces.

3-25. Marine Corps forces are tailored through their existing task organization to meet a combatant commander or JFC's needs. Organized as Marine air-ground task forces (MAGTFs), the Marine Corps provides the JFC with an appropriately scaled, integrated, combined arms force that includes air, ground, and logistic units under a single commander. Differing by size and capacity for sustained operations, MAGTFs are organized as either Marine expeditionary forces, Marine expeditionary brigades, Marine expeditionary units, or special purpose MAGTFs. Figure 3-1 presents the various MAGTFs and how they are organized and augmented to support the JFC. (See MCRP 1-10.1 for more information on Marine Corps task organization.)

Casualties

3-26. Although casualties can occur during any operation, casualty rates are highest during offensive operations in the jungle. The jungle's heavy vegetation and topography afford high levels of cover and concealment and provide a marked advantage to the defender. Higher casualties occur among troops on the offense, where observed assaults are often the only tactical option. Defenders generally have the ability to withdraw under cover and concealment and consequently suffer lower casualties from direct and indirect fire. Additionally, the requirement to evacuate casualties over large unimproved areas, and under difficult environmental conditions, make medical evacuation planning, resourcing, and positioning incredibly important and challenging. Due to the difficulties of ground evacuation in jungle operations, a greater emphasis on air evacuation is necessary. In areas where the jungle is too dense to prepare a landing zone, a helicopter equipped with a hoist or jungle penetrator may be necessary to extract casualties. (See ATP 4-25.13 for more information on casualty evacuation.)

3-27. Commanders conducting stability operations recognize the relationship between casualties, both military and civilian, and strategic objectives. While stability operations are associated with a lower casualty risk than offensive or defensive operations, casualties may adversely impact the success of the stability mission. The accumulation of casualties during protracted stability or limited contingency operations has the

potential to negatively influence domestic and international opinion. If commanders assess the casualty risk as high, they must ensure that their higher headquarters understands their assessment and that mission objectives are worth the anticipated risk, or they must apply additional resources to further mitigate the risk.

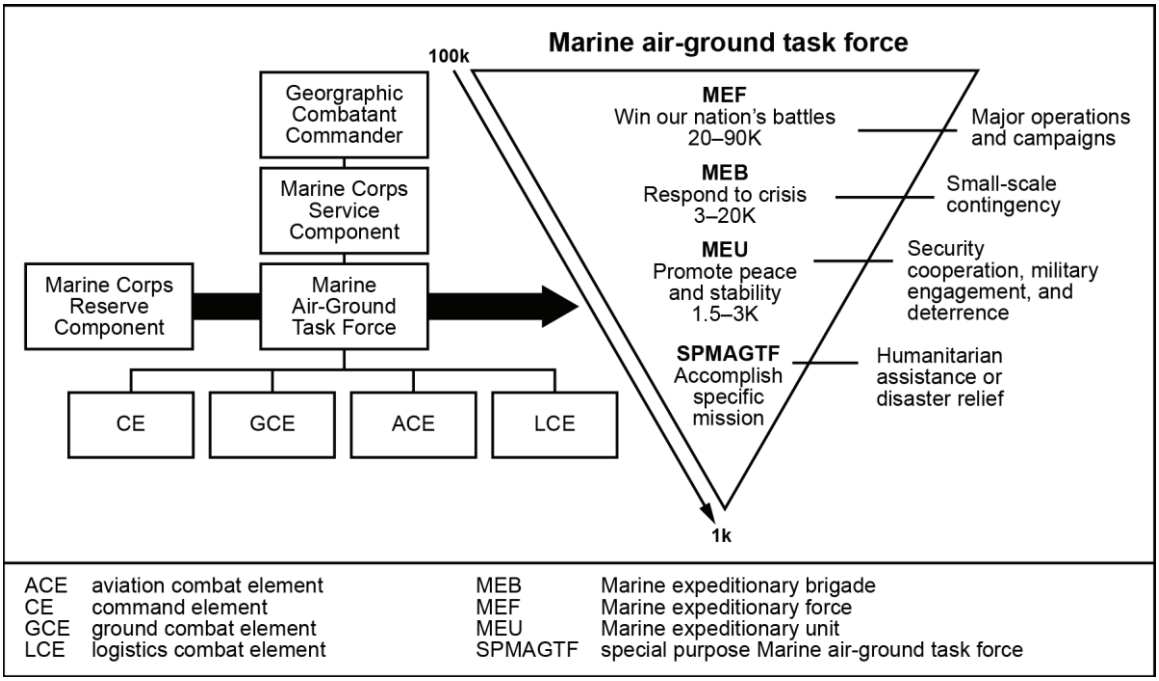


Figure 3-1. Marine air-ground task force

Collateral Damage

3-28. When considering risk to forces, commanders must also analyze the risk to the area's population, the natural environment, and infrastructure with respect to time. This comprehensive analysis includes the second- and third-order effects of significant civilian casualties, degradation to the natural environment, and infrastructure damage. Collateral damage influences world and domestic opinion and has the potential to affect ongoing operations; therefore, commanders will likely be held to a higher degree of restraint and precision in their operations. Collateral damage also influences the post conflict physical environment and attitudes of the population.

3-29. Negative perceptions caused by collateral and environmental damage can take generations to overcome. Destroying a populated area, piece of critical infrastructure, or damaging an environmentally sensitive area for a tactical requirement is generally not an acceptable option for commanders. The dispersed and relatively low density of civilian populations in some jungle areas does not negate the possibility that even accurate attacks with precision weapons may injure noncombatants. While preparatory MISO and nonlethal measures can greatly reduce civilian casualties and infrastructure damage, some degree of collateral damage may be unavoidable. It is possible that collateral damage resulting from tactical success could run counter to national and strategic objectives.

Fratricide

3-30. Commanders weigh the risk of fratricide when designing and executing jungle operations. The restrictive terrain and limited number of LOCs tend to compartmentalize forces and increase the risk of fratricide. As small units patrol wide areas of jungle, they may lose situational awareness regarding the size and location of friendly forces. This is compounded by the communications and navigation challenges associated with dense jungle terrain. Line of sight communications systems often suffer reduced ranges and the thick jungle canopy may degrade Global Positioning Satellite (GPS)-enabled navigation aids.

Commanders increase fratricide awareness and prevention measures during jungle operations. Fratricide may be caused by—

- Ineffective or degraded communications equipment.
- The inability to recognize near and far recognition signals.
- Short engagement ranges coupled with the need for quick reaction.
- Location errors caused by challenging terrain and degraded or disrupted navigation devices.

3-31. The risk of fratricide may also increase when Army/Marine Corps forces conduct operations with (or within proximity of) SOF, foreign security forces (known as FSFs), or host-nation forces. The JFC establishes a joint special operations area to maintain unity of command, create freedom of action, and clearly define authorities when SOF are present in the joint operations area.

Note. See Appendix D for more information on fratricide prevention during jungle operations.

Risk Reduction Measures

3-32. Commanders assess potential hazards and develop controls to eliminate or reduce the risks to Army/Marine Corps forces. Mitigating risk begins with thoroughly understanding the jungle environment and its effects on operations and forces. Other measures to mitigate risk include—

- Detailed planning to include thorough IPB and appropriate branch plans and sequels.
- Integrated information collection and dissemination.
- A clear mission and intent with a well-defined end state.
- Sufficient reserves and rotation of forces.
- Effective operations security (OPSEC) measures.
- Effective populace and resources control measures.
- Clearly defined ROE that are updated as the character of operations changes. ROE allow commanders to satisfactorily control operations and minimize collateral damage and fratricide without unreasonably restricting subordinates' ability to accomplish assigned missions.
- Proper targeting procedures (including effective fire support coordinating measures and a streamlined legal review of targets), positive identification of targets, and controlled clearance of fires. The goal is to achieve precise (yet rapid) effects with both lethal and nonlethal means. Positive air-to-ground communications are essential to effective CAS.
- Well-synchronized information operations that engage and inform the host-nation populace through the duration of operations.
- Responsive and flexible jungle sustainment.
- Sufficient control measures at echelon along with standard marking and identification techniques that address limited visibility concerns for both air and ground forces. Commanders ensure that all subordinate units thoroughly disseminate any approved nonstandard reference systems.

Knowledge Management

3-33. *Knowledge management* is the process of enabling knowledge flow to enhance shared understanding, learning, and decision making (ADP 6-0). *Knowledge management* is the integration of people and processes, enabled by technology, to facilitate the exchange of operationally relevant information and expertise to increase organizational performance (MCRP 1-10.2). Despite the mobile character of jungle operations and the lack of information infrastructure, commanders develop and implement methods for collecting and sharing information at the pace of operations. When knowledge management infrastructure is limited, simple procedures such as debriefs can be used to share information both vertically and laterally. Simple procedures are often the most effective and can be easily modified to meet environmental constraints. For example, information collected from patrol debriefs can be transmitted via frequency modulation (known as FM) communications to higher headquarters for distribution to other small units operating in the area.

3-34. As forces adapt their TTP for jungle operations, they collect best practices during after action reviews and share these lessons with their higher headquarters, subordinate forces, and other units in the AO. Staffs

should submit these lessons to the Center for Army Lessons Learned at https://call2.army.mil/ to ensure the widest dissemination outside the theater of operations. (See ATP 6-01.1 for more information on knowledge management.)

NETWORKS, INFORMATION, AND COMMUNICATIONS SYSTEMS

3-35. Commanders rely on networks and information systems to command effectively. Networks enable successful operations. Commanders determine their information requirements and focus their staffs and organizations on using networks to meet these requirements.

3-36. In many instances, the information systems available to the commander directly affect the speed and accuracy of the command and control components; commanders can leverage information systems and bring them to bear on emerging situations and critical issues. However, the jungle can challenge information and communications systems. Large distances between units, dense foliage, and the significant vertical relief prevalent in many jungles, coupled with the power constraints of man-portable radios, impede radio communications in the jungle. Problems with tactical communications impair the ability to maintain a common operational picture, give orders and guidance, request support, or coordinate and synchronize elements of the combined arms team. The use of mission orders and commander's intent is critical to remaining effective in a degraded communications environment, regardless of the source of the degradation.

3-37. Overcoming the challenges associated with communications in the jungle requires units to either increase the means of information collection and transmission, decrease the demand for information, or both. Figure 3-2 on page 3-10 depicts the relationship between information means and information demand. Other methods for overcoming challenges of communicating in the jungle include—

- The use of retransmission and relay sites, which include UASs.
- The use of airborne command posts, satellite communications, high-frequency radios, and other redundant communications platforms and systems.
- Careful positioning of commanders, command posts, and antennas to take advantage of jungle terrain features.
- Detailed analysis and communications planning when expanding or shifting an AO.

Visual Communication and Markings

3-38. Visual signals are any means of communication that require sight and can be used to transmit prearranged messages rapidly over short distances. This includes the devices and means used for the recognition and identification of friendly forces. The most common types of visual signals include hand-and-arm, flag, pyrotechnic, mirror, and ground-to-air-signals. Troops can use chemical light sticks, flashlights, and flares for visual signaling under limited visibility conditions.

3-39. Visual markings, both day and night, assist in command and control. Visual marking SOPs indicate unit locations and other essential information that allow units to communicate when transiting AOs and enable general situational awareness. Visual markings can also mitigate fratricide incidents resulting from the loss of radio communications, poor target identification, or navigational errors. Given the close engagement ranges and the potential for surprise, standardized visual recognition signals are an important fratricide mitigation measure when conducting jungle operations.

3-40. Troops regularly use hand-and arm-signals in all types of operations. When used in the jungle, Solders/Marines may have to adjust hand and arm signals to account for dense vegetation and limited visibility.

3-41. In most visibility conditions, units can use pyrotechnics. However, certain colors of smoke or flares have limited use because they blend in with vegetation (green) or offer little contrast with fog or haze (white). Careful selection of colors (such as red or yellow), which contrast with the background color of the jungle, increases the effective range of pyrotechnic signals. Units can also assign meaning to specific colors of pyrotechnics and smoke. Units must use caution when employing pyrotechnics in the jungle as the thick canopy may prevent star clusters and parachute flares from functioning properly. Units must also consider that the use of pyrotechnics can reveal the location of U.S. forces to the enemy, thereby making it difficult to

achieve surprise. Furthermore, if the enemy understands the meaning of the pyrotechnics, they may use them as part of a deception plan. (For more information on visual signals, see TC 3-21.60.)

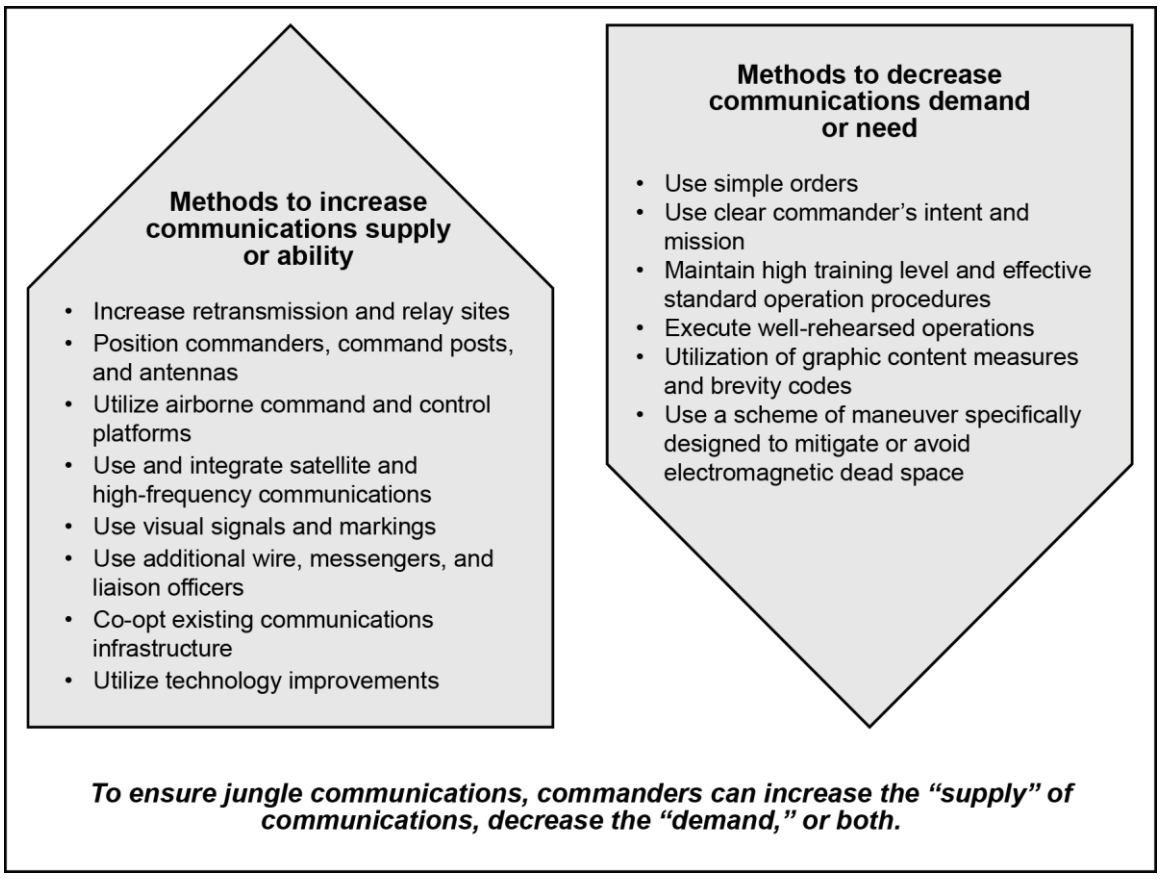


Figure 3-2. Overcoming jungle communications challenges

Audible Communication

3-42. Audible communication means include both voice communication and devices such as whistles, horns, and pyrotechnics. Solders/Marines use audible signals to attract attention, transmit prearranged messages, trigger action, or spread alarms. They are good only for short distances. Battle noise, weather, terrain, and vegetation reduce the range and reliability of audible communication. Like pyrotechnics, the use of audible communications devices may reveal the location of U.S. forces and forfeit the element of surprise. Audible signals must be simple to avoid misunderstandings and are usually prescribed in the unit SOP.

Messenger Communication

3-43. When troops have no other methods available, they can use messengers to communicate between separated units. However, this method often carries significant risk as the messenger may be intercepted and the communication compromised by the enemy. Additionally, the difficult terrain and lack of LOCs make communicating by ground messenger in the jungle difficult and slow. Vehicles will likely be limited to the few roads in the area while dismounted messengers will have to navigate challenging terrain and obstacles. An alternative is to send communication by air; however, this too may be difficult given the lack of available aircraft, the scarcity of landing zones, and inclement tropical weather. Units must exercise caution when delivering messages by air as aviation activity aids the enemy in locating friendly forces. When using a messenger, commanders write concise, complete, and clear messages. Utilization of encryption techniques can mitigate OPSEC concerns.

Radio Communications

3-44. Radio communications are normally the fastest and easiest way for tactical leaders and troops to communicate. Effective radio communications in the jungle require—

- Use of retransmissions and radio relays.
- Continuous preventive maintenance.
- Communications security (COMSEC).
- Trained operators.

3-45. The effectiveness of radio communications is reduced in jungle operations. Very high frequency and ultrahigh frequency radios (frequency modulation radios included) are particularly limited by dense foliage and terrain that obstruct transmissions. It is not unusual for frequency modulation radio range to be reduced by 10 to 25 percent in the jungle.

3-46. Satellite communications provide an effective means of communication when line of sight cannot be maintained. However, satellite communications require a clear view of the sky at the proper azimuth and elevation to establish a signal with a communications satellite and this can be challenging to achieve through the thick jungle canopy. Additionally, the large number of users and limited frequencies can negatively affect satellite-based communications availability at echelon.

Note. For further information on tactical radios, refer to ATP 6-02.53. For further information on satellite communications, refer to ATP 6-02.54. For a further information on field expedient antenna techniques, refer to FM 3-55.93. For further information on tactical radios, refer to ATP 6-02.72/MCRP 3-30B.3/NTTP 6-02.2/AFTTP 3-2.18. Soldiers/Marines should refer to all applicable technical manuals for specific preventive maintenance procedures for tactical radio equipment.

3-47. Commanders may use military wire, civilian telephone and communications infrastructure, and commercial communications infrastructure to communicate in the jungle. The local communications infrastructure offers an expedient means for establishing an emergency communications network or for building redundancy into the military communications plan. However, this method comes with significant risk and should never be used as the primary means of communication for U.S. forces. Local networks and infrastructure are often unsecure and may be easily compromised. Commanders make every effort to implement effective COMSEC measures when using local communications infrastructure for military communication. Although only used in emergencies, local communications infrastructure and cellular networks may be the only means for communicating with host-nation forces, civilian leaders, nongovernmental organizations (NGOs), and intergovernmental organizations (IGOs). Because these networks and infrastructure are often unsecure, Soldiers/Marines practice strict OPSEC to prevent being compromised by the enemy. When discussing matters over unsecured communications networks, troops avoid mentioning specific dates, times, locations, and capabilities.

3-48. COMSEC and OPSEC are complementary practices for protecting information. While communicating over COMSEC protected or encrypted devices enables more detailed discussion of operations, OPSEC ensures that essential or protected information is not exposed to the enemy. As such, commanders establish systems and practices for using both COMSEC and OPSEC during all communication.

COMMAND POSTS

3-49. Commanders organize their staffs and other components of the command and control system into command posts to assist them in effectively conducting operations. A *command post* is a unit headquarters where the commander and staff perform their activities (FM 6-0). A *command post* is a unit's or subunit's headquarters where the commander or designated representative and the staff perform their activities (MCRP 1-10.2). Command posts assist commanders in understanding, visualizing, describing, directing, leading, and assessing operations.

3-50. Commanders effectively employ their various command posts and retransmission stations to facilitate communications with forward and rear areas as maneuver units are unlikely to be stationary for extended

periods in the jungle. Higher echelon main command posts may be established on elevated terrain, such as hilltops, to enable communications across a large AO. Because they are larger, remain stationary for longer periods, produce a significant electronic signature, and may lack adequate concealment, these command posts are more susceptible to enemy detection and attack. Commanders identify a security force for the command post and ensure it is located on defensible terrain. Commanders plan for and mitigate the effects of enemy indirect fire on the command post. Lower echelon and tactical command posts are smaller and more mobile than larger, main command posts. In the jungle, these command posts capitalize on terrain and concealment to prevent enemy detection and attack. (For more information on command post organizations and responsibilities, see FM 6-0 and MCDP 6 and MCWP 3-10.)

MOVEMENT AND MANEUVER/MANEUVER WARFIGHTING FUNCTION

3-51. The *movement and maneuver warfighting function* is the related tasks and systems that move and employ forces to achieve a position of relative advantage over the enemy and other threats (ADP 3-0). *Maneuver* is employment of forces in the operational area, through movement in combination with fires and information, to achieve a position of advantage in respect to the enemy (JP 3-0). The Marine Corps' addendum for maneuver is the movement of forces for the purpose of gaining an advantage over the enemy. Maneuver is one of the warfighting functions (MCRP 1-10.2). Commanders use movement and maneuver/maneuver for massing the effects of combat power to achieve surprise, shock, and momentum. Effective maneuver requires close coordination with fires and sustainment support.

MOBILITY

3-52. Mobility in the jungle is restricted by thick vegetation, steep grades, and severe terrain. Vehicular mobility, whether wheeled or tracked, is almost completely restricted to roads and trails. Dismounted movement through thick jungle vegetation produces easy to spot tracks the enemy can follow. The high temperature and humidity also reduce rates of march for dismounted forces. Generally, jungles hinder the movement of large formations.

3-53. Heavy precipitation or monsoons can further restrict mobility in the jungle. Precipitation can create new water obstacles, increase the depth and rate of flow of existing bodies of water, and turn normally trafficable cross-country routes into impassible quagmires. Commanders conduct a route reconnaissance before initiating movement to confirm routes are passable. When possible, satellite or aerial imagery aids this reconnaissance confirming the status of wet and dry gaps along the route and the presence or lack of usable bridges.

3-54. Poor cross-country mobility, limited LOCs, and a lack of bridges can canalize movement and compartmentalize forces. Roads are usually scarce, poorly maintained, and primitive. The orientation of the existing roads may not support tactical and operational movement and maneuver/maneuver further limiting their utility. Limited infrastructure reduces hardened crossing points over or through water features. Effective staffs understand the effects of jungle terrain and allocate the necessary resources or implement creative and innovative solutions to achieve their commander's intent.

Methods of Movement

3-55. Air movement, air assault, and airborne operations are methods of movement conducive to jungle operations. They facilitate the rapid movement of small units across wide areas and can be used to conduct a vertical envelopment, execute a raid, provide reinforcements, pursue or block a withdrawing enemy, and seize key terrain. An *air assault* is the movement of friendly assault forces by rotary-wing or tiltrotor aircraft to engage and destroy enemy forces or to seize and hold key terrain (JP 3-18). Marine Corps amplification is operations in which air assault forces (combat, combat support, and combat service support), using the firepower, mobility, and total integration of assault support assets in their ground or air roles, maneuver on the battlefield under the control of the mission commander to provide mobility and firepower of the assigned mission (MCRP 1-10.2). These operations allow the commander to maneuver rapidly, accelerate the momentum of an engagement, and achieve a position of temporary advantage without requiring ground LOCs. However, air movements and air assaults often require helicopter landing zones, while airborne

operations require a clear drop zone. These requirements may limit the feasibility of airborne and air assault operations in the jungle. Air movement, air assault, and airborne operations require extensive planning, synchronization, and the application of significant combat power; they are generally high risk missions. These operations can be affected by changing weather conditions, environmental hazards, and enemy air defense capabilities. (See FM 3-99, ATP 3-04.1, MCTP 3-01B, and MCWP 3-20 [MCWP 3-2] for greater detail regarding movement and maneuver/maneuver and aviation operations.)

3-56. An *amphibious operation* is a military operation launched from the sea by an amphibious force to conduct landing force operations within the littorals (JP 3-02). Amphibious operations use maneuver principles to transition ready-to-fight combat forces from the sea to shore in order to achieve a position of advantage over the enemy or to gain access to an AO by establishing a lodgment. During combat operations, maneuver—in conjunction with fires (organic and supporting)—is essential to gaining access where the enemy least expects it.

3-57. Certain amphibious operations (assaults and raids) seek to exploit the element of surprise and capitalize on enemy weakness by projecting and applying combat power precisely where it is least expected. Units can conduct other types of amphibious operations more deliberately as feints or demonstrations. Amphibious operations require the unique ability to operate across air, land, and sea and are characterized as the most complex and difficult of military operations. Units can conduct five kinds of amphibious operations: amphibious raid, amphibious demonstration, amphibious assault, amphibious withdrawal, and amphibious force support to crisis response and other operations. Many jungles contain littoral areas conducive to amphibious operations. (See JP 3-02 and ATP 4-15 for greater detail regarding amphibious operations.)

3-58. Units conduct riverine operations in the jungle to transport troops and equipment across water obstacles or along waterways in support of movement and maneuver/maneuver. Riverine operations include the use of watercraft and amphibious vehicles. Usually Army and Navy forces undertake riverine operations in either joint or independent operations. Navy riverine forces contribute operational depth for inland power projection by conducting the following missions: maritime security operations, control of rivers and inland waterways, denial of enemy use of rivers and inland waterways, and limited offensive and defensive operations. Riverine forces provide additional assets to the commander to shape the AO as well as overcome water obstacles such as lakes, rivers, harbors, and deltas in both littoral and inland regions. Marines equipped with amphibious AAV and ACV can use their vehicles to swim rivers and water obstacles encountered during jungle operations. (See ATP 4-15 and MCRP 2-10A.6 [MCWP 2-25] for greater detail regarding riverine operations.)

3-59. Jungle amphibious and riverine considerations include—

- Vegetation.
- Security.
- Reconnaissance.

3-60. The heavy vegetation along the banks of inland waterways offers excellent concealment and enhances the effectiveness of ambushes against watercraft. Troop leader plan counter ambush measures in conjunction with all water movements. Steep, slippery river banks coupled with dense vegetation often make committing the waterborne force in a coordinated assault landing extremely difficult.

3-61. Security measures during the movement phase along a jungle waterway include proper watercraft formations and air observation, when possible. Fire support, to include surface-to-surface, air-to-surface, and naval surface fire, must be preplanned for all water movements.

3-62. Leaders plan for waterway reconnaissance. Like route reconnaissance, troops conduct waterway reconnaissance to determine the depth, trafficability, and the impact of the tide on waterways. This information is critical in determining the feasibility of using rivers and other inland bodies of water for movement and maneuver/maneuver. Waterway reconnaissance identifies the type and size of watercraft that can operate on the reconnoitered waterway. While aerial reconnaissance yields a considerable amount of information, leaders supplement it with reconnaissance by boat, especially in areas where vegetation has overgrown tributaries.

3-63. Gap crossings are among the most critical, complex, and risky combined arms operations. The size of the gap, as well as the enemy and friendly situation, dictates the method used to cross the gap. Gap crossings

by dismounted forces in the jungle can simply involve constructing a rope bridge or improvised rafting techniques (see Appendix B). Successful execution of gap crossing by mounted forces in the jungle requires significant and specialized engineering assets. Hasty river crossings with existing bridges or causeways in the jungle require careful inspection by engineers to determine the integrity and load bearing capacity of the bridge. Additional considerations for gap crossing in the jungle include—

- Careful planning of limited and unimproved LOCs to ensure the placement of standard bridging assets. Jungle LOCs may not support the ground movement of bridging assets to their required location and commanders consider using aviation if available to lift bridging equipment.
- A requirement for engineers to clear and improve LOCs to support the movement of standard bridging assets to the crossing site when aviation assets are unavailable.
- Clearance of brush and dense vegetation on both the near and far sides of the crossing site to support the emplacement of bridging assets.
- Engineer reconnaissance of entry and exit banks to ensure the soil at the crossing site can support the establishment of a bridge.
- The use of float bridges, rafts, standard ribbon bridges, and improved ribbon bridges for river crossing operations.
- The use of nonstandard bridging to cross personnel and equipment across gaps in the jungle. Readily available natural materials may be used to construct nonstandard bridges.
- Fording as an expedient method for crossing streams. However, the preparation of entrances and exits may be extremely difficult, and fords deteriorate rapidly under traffic and heavy rainfall. Before fording, engineers inspect the bottom of the stream or river to ensure it can support the weight of crossing vehicles.

Jungle Movement Technique

3-64. Dense vegetation and restrictive terrain may require modified movement techniques for small units operating in the jungle. Figure 3-3 presents a multiple column movement technique for dismounted forces operating in confined or densely vegetated mobility corridors.

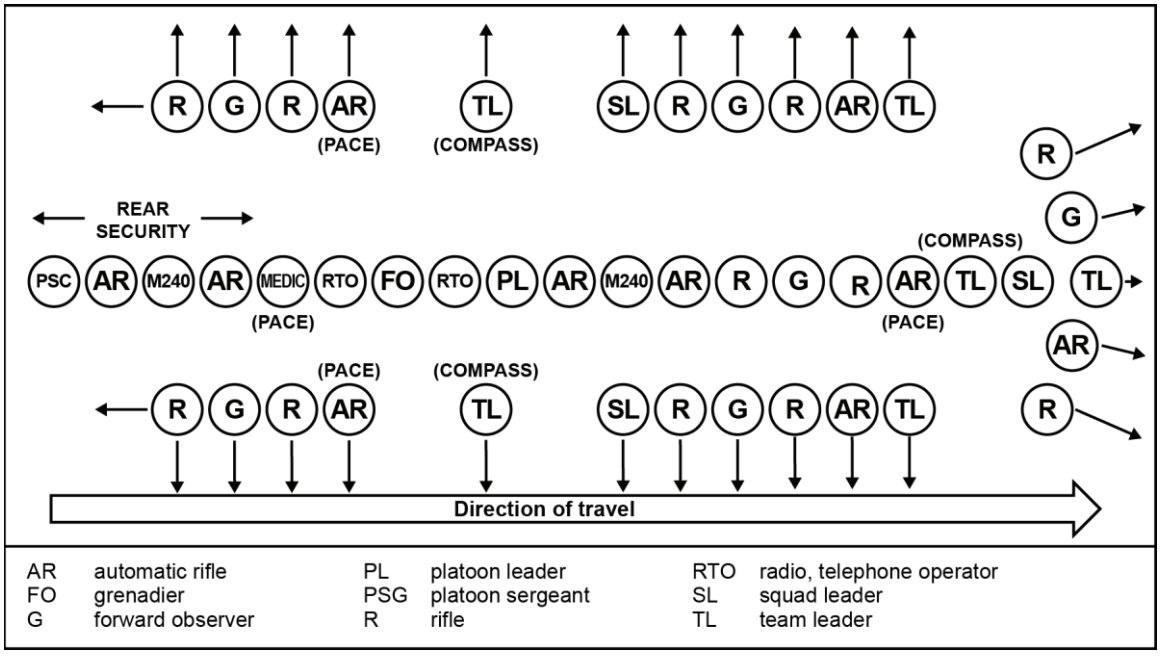


Figure 3-3. Jungle movement technique

Note. The position of the platoon leader and adjacent squad leaders during movement make it easier to expand the formation's flanks at halts to form a hasty perimeter. The locations of the machinegun teams enable the rapid assignment of security sectors, often to the front and rear of the movement formation during halts. The formation shown depicts a 45 Soldier/Marine platoon; however, it can be effectively used with lesser numbers.

3-65. Units consider the following when employing the jungle movement technique:

- The lead fire team of the lead squad assumes a modified wedge formation.
- The support elements may move with the headquarters element or be attached to a squad depending upon likely threats.
- Each squad maintains an azimuth and pace.
- Units update and rehearse battle drills to account for the jungle movement technique.
- The jungle movement technique works best during daylight movement.

3-66. Advantages of the jungle movement technique:

- Centralized control.
- Rapid deployment to maneuver or reinforce.
- A 360-degree security during movement and at halts.
- The use of multiple columns allows the delegation of navigation responsibilities with little risk for deviation.
- Direct fire assets positioned for rapid reaction to a flank ambush.
- Speed and ease of movement.

3-67. Disadvantages of the jungle movement technique:

- Limited direct fire assets to the front or rear.
- Column formation vulnerable to indirect fire.
- Center squad and headquarters element cannot return fire rapidly during ambush.

COUNTERMOBILITY

3-68. Commanders conduct countermobility tasks to deny an enemy freedom of movement and maneuver. Countermobility tasks enhance the restrictive effects of natural obstacles with the use of man-made obstacles to challenge or prevent enemy movement and maneuver. Due to the restricted mobility inherent in jungle operations, even small and relatively simple obstacles that are properly emplaced and observed can effectively control enemy movement. Careful terrain analysis ensures that naturally restrictive terrain is reinforced with obstacles to fix, turn, block, or disrupt enemy movement according to the commander's plan.

3-69. Countermobility operations help isolate the battlefield and protect attacking forces from enemy counterattack. Commanders exploit terrain that offers natural flank protection to an attacking force, such as rivers or ridgelines. Troops can easily reinforce some natural terrain features—swamps, canals, lakes, forests, and escarpments—for flank security. Units protect their flanks by destroying bridges, emplacing minefields, and using self-destructing and self-deactivating scatterable munitions to deny roads and trails. Countermobility operations in the jungle require rapid emplacement and flexibility; engineer support must keep pace with advancing maneuver forces and be prepared to emplace obstacles.

3-70. Minefields, wire obstacles, and antivehicle ditches require significant resources to emplace; however, they can be extremely effective. Local materials for expedient obstacles are usually plentiful in the jungle. Commanders and planners ensure that competing demands for engineering assets do not compromise survivability efforts. Because antivehicle ditches cannot be concealed, they must be dug so they do not outline a defensive front or flank. Troops need to cover antivehicle ditches by fires and reinforce them with other obstacles to prevent enemy infantry using them as ready-made trenches. In suitable terrain, antitank ditches should exceed the vertical step of enemy main battle tanks.

3-71. The family of scatterable mines (FASCAM), which includes volcano ground and air-delivered mines, the modular pack mine system, artillery-delivered mines, and air-delivered mines, can be used to disrupt

enemy movement in the jungle. Troops can emplace FASCAM remotely and use a self-destruct on command or after a pre-programmed time. The use of mines may be subject to increased approval authorities in accordance with the ROE. Artillery-delivered FASCAM does not deploy well in soft soils and not all types can be deployed into water covered areas.

3-72. Given the limited number of roads and the difficulties inherent to bypassing, road craters and abatis work effectively as countermobility measures in the jungle. More valuable than roads, commanders destroy bridges as a countermobility measure only after careful consideration. Units may need bridges for future operations, so destroying them has the potential to greatly impact operational variables throughout the AO.

CHALLENGES TO MOVEMENT AND MANEUVER/MANEUVER

3-73. Dense foliage and restricted observation put units moving in the jungle at risk of ambush. To mitigate this risk, units use point, flank, and rear security teams to identify and provide early warning of an ambush. These teams must position far enough away from the main body so that if they make contact, the enemy will not engage the whole force. However, they should not be so far away that they cannot provide mutual support. These security teams must stay alert to signs of the enemy and should carry as light a load as possible so they can maneuver quickly and easily. The main body and the security teams maintain contact to prevent fratricide.

3-74. Temporary halts place units at risk of discovery and attack. Units plan halts on terrain that lends itself to a perimeter defense. During short halts, troops find cover, drop to one knee, and face outward with their weapon at the ready. If the halt occurs at a trail crossing, leaders send security teams out along the trail. The security team remains in place until the unit clears the crossing. During longer halts, units establish a perimeter defense. They establish listening posts and observation posts around their positions and employ claymore mines and early warning devices. Patrol bases and perimeter defenses established at night are smaller than those established during the day.

MOVEMENT AND MANEUVER/MANEUVER DURING LIMITED VISIBILITY

3-75. Improvements to night vision, navigation, and communications technologies, coupled with well-trained Soldiers/Marines, enable jungle operations during limited visibility. Historically, forces conducted jungle operations mostly during daylight because of technological limitations, navigational challenges, and fatigue. The ability to operate at night or in periods of limited visibility is an advantage that Soldiers/Marines have over less developed or ill-equipped forces. The ability to operate around the clock offers commanders a greater number of potential COAs to attack an enemy. Reduced visibility is also an advantage to combat aviation assets that can mitigate the threat of visually guided air defense systems by operating at night. However, commanders also consider the effects that weather, vegetation, ambient lighting, fires, background illumination, and the use of searchlights by threat forces may have on the effectiveness of NVDs and thermal imaging devices.

3-76. Improvements in sensors and processing techniques enable forces to detect and observe movement and maneuver/maneuver that was not previously detectable. Coherent change detection enables a force to determine when a vehicle transited an area based on tracks left in the soil. By comparing radar images of the same road or trail over time, units can determine traffic patterns, the type of traffic that has used the road, and the volume of traffic along the road or trail. Aviation units equipped with Synthetic Aperture Radar may have the capability to provide radar comparisons. While leaders can use coherent change detection to track enemy forces, commanders also consider that the enemy can use the same technology to track friendly forces. Soldiers/Marines seeking to avoid detection by coherent change technologies avoid the use of unimproved trails and roads. Coherent change detection technology overcomes older mitigation techniques to mask movement and maneuver/maneuver. Technology will continue to find ways to overcome current methods to conceal movement and maneuver/maneuver requiring units to make additional changes to the way they conduct operations to mitigate new capabilities.

INTELLIGENCE WARFIGHTING FUNCTION

3-77. The *intelligence warfighting function* is the related tasks and systems that facilitate understanding the enemy, terrain, weather, civil considerations, and other significant aspects of the operational environment (ADP 3-0). Other significant aspects of an operational environment include threats, adversaries, and

operational variables which vary with the nature of operations. *Intelligence* is the product resulting from the collection, processing, integration, evaluation, analysis, and interpretation of available information concerning foreign nations, hostile or potentially hostile forces or elements, or areas of actual or potential operations (JP 2-0). The Marine Corps amplification is knowledge about the enemy or the surrounding environment needed to support decision-making. Intelligence is one of the six warfighting functions (MCRP 1-10.2). The intelligence warfighting function synchronizes information collection with the primary tactical tasks of reconnaissance, surveillance, security, and intelligence operations. Commanders drive the operations process/MCPP and focus the intelligence efforts that support it. Developing intelligence is a continuous process that involves analyzing information from all sources and conducting operations to develop the situation. (FM 2-0 and MCWP 2-10 (MCWP 2-1) provide more information on the intelligence warfighting function.)

3-78. Like other environments, intelligence professionals perform all the intelligence disciplines in the jungle. The intelligence disciplines consist of counterintelligence (known as CI), measurement and signature intelligence, geospatial intelligence, human intelligence (HUMINT), open-source intelligence, signals intelligence, and technical intelligence.

3-79. The character of combat in the jungle directly affects intelligence operations. Consisting of small units operating over wide areas, the character of jungle operations requires the rapid processing, exploitation, and dissemination (known as PED) of collected information if it is to become actionable intelligence. Light and dismounted enemy forces' ability to quickly change their location, direction of travel, and objectives means that units need to exploit and disseminate quickly any collected information so it remains relevant. Dispersed friendly forces across large AOs with complex terrain only magnify challenges to processing, exploitation, and dissemination , so commanders utilize the entire staff to develop processes and systems to deliver relevant intelligence to small units in a timely manner.

3-80. Given the lack of infrastructure and technology in most jungles, the detection of even faint electronic signatures can indicate the enemy's presence. As such, measurement and signature intelligence and signals intelligence operations can prove particularly effective in the jungle. Without interference from urban areas or other telecommunications activities, these operations can provide precise information on enemy size, location, and disposition.

PLAN AND DIRECT

3-81. Planning and directing the information collection plan is critical to intelligence operations in the jungle. However, leaders modify techniques for information collection to account for jungle terrain and weather. Heavy rainfall, high and constant temperature, high humidity, and thick vegetation may limit the capabilities of information collection assets. Units account for these limitations by building redundancy into the collection plan and by assigning the most reliable collection assets to high priority named areas of interest and target areas of interest.

3-82. Information collection is challenged by the thick jungle canopy. The thick canopy degrades satellite and aerial surveillance in the jungle. The dense jungle canopy also prevents ambient light from penetrating to the ground, reducing the effectiveness of NVDs. Lack of ambient light combined with high humidity and high temperatures may cause IR sensors to be less effective. Mobility restrictions also require that all information collection systems be light, man-portable, and rugged.

COLLECT AND PROCESS

3-83. The intelligence staff synchronizes collection and processing to provide critical information at key times throughout the phases of an operation. Collection and processing are mutually dependent; units process information collected and, in turn, use it to drive future collection efforts.

Environmental Considerations

3-84. Key staff considerations for information collection in the jungle:

- Limited named areas of interests, target areas of interests, and engagement areas due to the lack of mobility corridors and infrastructure.
- Heavy, dense vegetation restricts vehicular mobility but favors dispersed and dismounted infantry operations.
- Rate of movement times increase due to heavy vegetation.
- Changes to mobility corridors and avenues of approach due to rain and monsoons.
- Degraded performance of personnel and equipment due to torrential rains and high humidity.
- Roads, rivers, streams, fording sites, and landing zones are more likely to be key terrain.

3-85. Collection asset considerations in a jungle environment:

- Unattended ground sensors are limited to short range detection due heavy rain and thick vegetation.
- Thick vegetation limits electro-optical sensors.
- High humidity and temperatures reduce IR collection by overhead and aerial collectors.
- Moisture and fungi in the jungle can increase the failure rate of electronic and communications equipment, necessitating additional maintenance.

3-86. Initial information collection requirements in jungle environments may be answered by aerial or overhead platforms using radar systems to detect manmade objects or, vegetation permitting, the use of electro-optical platforms. Overhead imagery should be less than four months old as trails and clearings can grow over or change dramatically during that time.

3-87. Lightly equipped long-range surveillance and dismounted scouts play a major role in information collection tasks in a jungle environment. The rugged terrain improves chances for accomplishing their mission unobserved and undetected.

3-88. Transmitting collected information is challenged by the dense vegetation and sharp vertical relief prevalent in many jungles. Electronic sensors and information collection devices may fail or operate at their less than maximum effective range. Commanders build redundancy into information transmission and communications systems to ensure that troops transmit and process information collected.

Interacting with the Population

3-89. Although population densities in the jungle are traditionally low, interacting with local nationals should not be discounted or overlooked. Local nationals can provide important information regarding an operational environment and may become a valuable source of intelligence. Because trained HUMINT collectors may be in short supply, commanders cultivate a relationship with local nationals in their AO to support the overall information collection effort.

3-90. Effective civil-military relations and information sharing require the use of liaisons. Although this liaison is often accomplished through a civil-military operations center (CMOC), commanders may establish liaisons with the populace in their AO to exchange information and influence operations at the local or provincial, or regional level. These liaisons work best when established with local government officials or community leaders. The exchange of reliable and relevant information stems from trust, and commanders strive to build rapport with the local populace, coalition partners, NGOs, and unified action partners. U.S. forces earn the trust of people, regardless of their affiliation, by treating them humanely with dignity and respect and by demonstrating personal integrity. U.S. forces can acquire critical information through interactions with local leadership (both formal and informal), government officials, business owners, NGO workers, local residents, and detainees. Commanders direct unit leaders to conduct liaisons with local leaders and key members of the community to answer information requests. Commanders ensure that only trained and certified intelligence professionals conduct HUMINT operations separately and distinctly from civil-military liaison in accordance with FM 2-22.3, MCRP 2-10A.2, AR 381-100, and DODD 3115.09. Staffs forward information collected from Soldiers/Marines and liaisons to the intelligence staff for processing, exploitation, and dissemination.

3-91. NGOs can serve as a valuable source of information for units operating in the jungle. Many NGOs provide basic essential services through medical aid, food delivery, and infrastructure projects. As such, these

organizations often have a persistent and long-standing presence in the jungle and can provide critical information on the local populace, terrain, and infrastructure. They may provide information on displaced persons, endemic diseases, and even accurate maps or knowledge of the terrain. Commanders often liaise with NGOs through the CMOC, where all parties exchange information regularly to coordinate efforts, alleviate suffering, or, at a minimum, prevent collateral damage. NGOs may have access to material aid or resources unavailable to the joint force but may require joint logistics or security assets to deliver it effectively. This mutually supportive relationship between the joint force and NGOs can help shape the local security environment. NGOs may also have—

- A network of influential associations.
- An extensive understanding of the jungle infrastructure.
- Key knowledge of political and economic influences in the region.
- A keen awareness of significant changes in the jungle environment.
- Insight into the current security situation.
- Current maps and terrain information.

3-92. Effective commanders avoid confusing productive civilian relationships with HUMINT military source operations. Only trained HUMINT personnel recruit and task sources to seek out intelligence information. Normally troops collect information obtained from interactions with the populace during normal military operations, such as a patrol or a key leader engagement. As Soldiers/Marines establish rapport and trust with the local populace, individuals may be inclined to offer increasing amounts of information on the threat or other variables. However, commanders ensure that troops do not tie the information civilians provide to promises of assistance or monetary gain.

3-93. When possible, commanders take steps to protect local nationals who cooperate with U.S. forces. They recognize that repeated interactions with U.S. forces may put local nationals and their family at risk from the enemy. Before this potential danger becomes a reality, commanders refer civilian contacts to trained HUMINT personnel who can handle them more securely and effectively. This protection becomes particularly important when information from the contact proves credible, appears relevant, and—

- Provides essential information on a repetitive basis.
- Helps answer critical information requirements.
- Affects operations in another AO.
- Requires monetary compensation to obtain.

Processing

3-94. Once troops collect information, intelligence personnel process it into a format that enables analysts to extract essential information and place it within the wider intelligence framework. During processing, intelligence personnel and systems convert data into information that commanders, staffs, and unified action partners can use.

PRODUCE

3-95. Production is the development of intelligence through the analysis of collected information and existing intelligence. Analysts create intelligence products, conclusions, or projections regarding threats and relevant aspects of an operational environment to known or anticipated requirements. (See ATP 2-33.4, ATP 2-19.4, or MCTP 2-10B [MCWP 2-3] for more information on intelligence production.)

DISSEMINATE

3-96. Commanders receive combat information and intelligence products in a time and manner that facilitates situational understanding and supports decision making. To accomplish this, the commander and staff develop an intelligence dissemination network that rapidly delivers relevant intelligence to the point of need without overwhelming the recipient with information. This can be challenging in the jungle, where units spread out over large areas and restricted terrain and dense vegetation impede communications. (Refer to MCTP 2-10C [MCWP 2-4] for intelligence dissemination.)

TECHNOLOGY ENHANCEMENTS AND CHALLENGES

3-97. Effective information sharing and collaboration requires the use of common network analysis software and databases by joint forces and unified action partners. The challenges associated with sharing information across digital systems and networks must be addressed during the MDMP/MCPP.

3-98. Biometric data collection is an important part of the overall intelligence, targeting, and force protection architecture. *Biometrics* is the process of recognizing an individual based on measurable anatomical, physiological, and behavioral characteristics (JP 2-0). Biometrics use unalterable physical traits to identify and, if necessary, catalog an individual in a known database. Forces can use this capability to identify an enemy seeking to hide among the populace in the jungle. When screened against forensic evidence, biometrics can link an individual to past aliases, locations, and events. Biometric technologies and the TTP for their employment are dynamic and rapidly changing. Units can use biometrics to—

- Confirm the identity of suspect individuals, including high-value individuals.
- Link persons to events through forensics, such as fingerprints.
- Facilitate time-sensitive targeting.
- Restrict base access to authorized personnel.
- Create access badges and credentials.
- Screen local hires and contractors for security threats.
- Screen applicants during security force recruitment drives.
- Enhance checkpoint operations by restricting the movement of threat forces.
- Process personnel during site exploitation.
- Control movement across borders or boundaries.
- Identify and process detainees.

3-99. Although primarily used by military police and intelligence professionals, all Soldiers/Marines can train to use biometrics. (For more information on the use of biometrics during operations, see ATP 2-22.82 and ATP 2-22.85/MCRP 10-10F.1/NTTP 3-07.16/AFTTP 3-2.85.)

FIRES WARFIGHTING FUNCTION

3-100. The *fires warfighting function* is the related tasks and systems that create and converge effects in all domains against the adversary or enemy to enable operations across the range of military operations (ADP 3-0). *Fires* is the use of weapon systems or other actions to create specific lethal or nonlethal effects on a target (JP 3-09). The Marine Corps amplification is those means used to delay, disrupt, degrade, or destroy enemy capabilities, forces, or facilities as well as affect the enemy's will to fight. Fires is one of the warfighting functions (MCRP 1-10.2). *Fire support* are fires that directly support land, maritime, amphibious, space, cyberspace, and special operations forces to engage enemy forces, combat formations, and facilities in pursuit of tactical and operational objectives (JP 3-09). Marine Corps amplification is assistance to elements of the Marine air-ground task force engaged with the enemy rendered by other firing units, including (but not limited to) artillery, mortars, naval surface fire support, and offensive air support (MCRP 1-10.2). Fires can be delivered by armed aircraft, land- and sea-based indirect fire systems, air and missile defense systems, and EW systems.

3-101. The jungle's terrain, topography, and dense vegetation may affect fire support. Target acquisition is degraded by thick vegetation or weather, and the restrictive terrain may prevent land-based fires from positioning in support of maneuver forces. As such, maritime or air-based fires are often the most responsive and effective in jungle environments. Lighter, man-portable fires, such as mortars, also work well in the jungle.

TARGETING

3-102. *Targeting* is the process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities (JP 3-0). Units may use the Army targeting process and the joint targeting cycle to integrate and synchronize fires into operations, creating the desired effects in time and space. Through targeting, fires cells recommend targeting guidance to the commander;

develop targets; select targets for attack; and coordinate, integrate, and assign allocated joint, interagency, and multinational fires to specific targets. There are two types of targeting: deliberate targeting and dynamic targeting.

3-103. Deliberate targeting prosecutes planned targets. These targets are known to exist in the AO and have actions scheduled against them. Deliberate targets often consist of infrastructure or fixed sites that are identified early in an operation and placed on the joint air tasking order or included in a fire support plan. Dynamic targeting prosecutes targets of opportunity and changes to planned targets or objectives. Targets of opportunity are targets identified too late, or not selected for action in time, to be included in deliberate targeting. Targets engaged as part of dynamic targeting are previously unanticipated, unplanned, or newly detected.

3-104. Targeting in the jungle can be challenging due to the difficulties of identify and locating high-payoff targets in dense vegetation. A *high-payoff target* is a target whose loss to the enemy will significantly contribute to the success of the friendly course of action (JP 3-60). Consequently, more units commonly employ dynamic targeting due to the fleeting nature of finding, fixing, and tracking of high-payoff targets.

3-105. Dynamic targeting consists of six steps:

- Find. Detect and classify targets for prosecution.
- Fix. Determine the location of the potential target.
- Track. Observe and monitor the target's activity and movement.
- Target. Decide whether to engage the target and select and coordinate the means to create the desired effects.
- Engage. Take action against the target.
- Assess. Focus on the results of the target engagement. Battle damage assessment (BDA) is critical to determine if an immediate reattack is required.

3-106. Dynamic targeting is not separate from the joint targeting cycle. All potential targets nominated for attack continually change in importance due to the dynamic nature of combat. When the target poses a danger to friendly forces, or it presents a lucrative, fleeting opportunity to gain tactical advantage, the JFC may designate an attack. Units may anticipate and plan for targets as deliberate actions in the joint targeting process, or they may elevate in priority or order the targets for attack once discovered.

MORTARS

3-107. Mortars are high-angle, relatively short-range, area fire weapons that troops can use effectively during jungle operations. Their light weight and mobility make them well suited for close support of maneuver forces. They are ideal weapons for attacking targets on reverse slopes, in depressions, and other areas difficult to reach with direct or low-angle fires. (See ATP 3-21.90/MCTP 3-01D for additional information on mortars and their capabilities.)

3-108. Soft or saturated soil and thick canopy can affect mortar employment in the jungle. Soft or saturated soil may not support the weight or recoil of heavy mortars, and dense canopy may negate the overhead clearance required to effectively employ mortars. Units may require chain saws and demolitions to clear areas of dense brush and overhead cover.

Note. For more information on the tactical employment of mortars, Soldiers/Marines refer to TC 3-22.90 and ATP 3-21.90/MCTP 3-01D.

FIELD ARTILLERY

3-109. The role of the field artillery is to destroy, neutralize, or suppress the enemy by cannon, rocket, and missile fire and to integrate and synchronize all fire support assets into operations. A jungle environment poses unique challenges to both maneuver and field artillery commanders by restricting movement, observation, fields of fire, communications, and target acquisition.

3-110. Jungle battles are characterized by limited visibility and close combat. Units often employ fire support danger-close and must carefully coordinate with supporting fire direction centers and adjacent maneuver units. Staffs adjust frequently using creeping techniques and sometimes sound.

NAVAL GUNFIRE

3-111. Naval gunfire, along with CAS, is employed in amphibious operations prior to the landing of artillery units. After maneuver and artillery elements are established ashore, U.S. Navy ships can provide reinforcing artillery support in jungle areas near the coast. Destroyers or littoral support ships sometimes provide support along large jungle rivers.

3-112. When units conduct operations within range of naval gunfire, the nearest fire support coordination center normally has naval gunfire liaison officers. These officers arrange for ground and aerial spotters for the maneuver units. Alternatively, forward observers can adjust the ship's fires. Units can find the call-for-fire and adjustment procedures for naval surface fire support in ATP 3-09.32/MCRP 3-31.6/NTTP 3-09.2/AFTTP 3-2.6.

3-113. Naval gunfire results in large-range probable errors (the dispersion pattern of the naval gun is roughly elliptical with the long axis in the direction of fire). Hence, coverage of targets such as roads and airfields is most effective when the gun-target line coincides with the long axis of the target. Naval guns can deliver very close supporting fire when the gun target line runs parallel to the front line of troops. Oppositely, a gun-target line perpendicular to the front trace can endanger friendly forces.

3-114. Naval gunfire provides low trajectory ordnance. This might cause a problem in heavily forested jungle areas if the projectile strikes tall trees, detonating prematurely over friendly troops.

ROCKET AND MISSILE FIRES

3-115. The multiple launch rocket system (MLRS) and High Mobility Artillery Rocket System (HIMARS) provide rocket and missile fires, complementing canon artillery and all other fire support assets, in support of the maneuver commander. MLRS and HIMARS have all-weather, long-range capabilities, and full suites of munitions providing massive destructive capability. Munitions available for the MLRS and HIMARS include unitary warheads, variable fusing, sub-munitions, extended ranges, and precision guidance.

3-116. MLRS is a highly mobile, lightly armored, tracked vehicle capable of carrying two launch pods of rockets or missiles. The HIMARS is an air transportable, armored cab, wheeled vehicle capable of carrying one launch pod of rockets or missiles. MLRS and HIMARS have limited off-road capabilities and require relatively large areas clear of masks and overhead cover, which makes their maneuver and employment in the jungle environment challenging.

3-117. The lethality, range, and accuracy of some MLRS and HIMARS munitions result in the largest danger-close distances of any Army/Marine Corps organic fires asset. Since troops in the jungle often fight engagements at extremely close distances, the large danger-close requirement for the MLRS and HIMARS may limit their employment during jungle operations. The commander and fire direction center must take proper precautions when employing rocket and missile fires danger close.

AIR-GROUND OPERATIONS AND CAS

3-118. In the jungle, where meeting engagements and movement to contacts are common, aerial fires can provide responsive fire support to troops in contact. CAS and attack helicopters can also engage targets closer to friendly troops than indirect fire assets.

3-119. Airborne forward air controllers are more effective than ground observers in densely forested areas because they have a broader view of the battlefield. To prevent fratricide, units employ pre-planned signals to identify friendly forces when using CAS or attack aviation. They might use pyrotechnics, colored smoke, or visual signaling panels to identify friendly forces on the ground. However, units consider that using these signaling techniques also reveals the location of friendly forces to the enemy. Units use fires, both direct and indirect, to mark targets for follow-on CAS.

3-120. The combat radius and payload of attack helicopters is heavily affected by environmental factors in the jungle; fixed-wing aircraft are also impacted but not as significantly. Generally, as the temperature, altitude, and operating weight of an aircraft increases, its combat radius is reduced. Therefore, the commander positions attack aviation platforms and their support assets as far forward as possible to support anticipated troops in contact.

AIR AND MISSILE DEFENSE

3-121. Air defense forces include air defense radars, weapons systems, and appropriate communications equipment. The relatively large maneuver areas associated with jungle operations challenges the ability of air defense forces to provide simultaneous coverage over all critical assets. The critical asset list (CAL) is a prioritized list of assets or areas, normally identified by phase of the operation and approved by the joint force commander that should be defended against air and missile threats (JP 3-01). After prioritizing critical assets against the protection resources available, the commander and staff develop the defended asset list (DAL). The defended asset list is a listing of those assets from the critical asset list prioritized by the joint force commander to be defended with the resources available (JP 3-01). Air and missile defense assets are then allocated to protect identified assets.

3-122. Because of their mutually supportive relationship, commands station air defense units close to maneuver units. This provides the maneuver units with air defense coverage while also ensuring that the air defense forces have protection from enemy ground threats. To maintain this mutually supportive relationship in the jungle, dismounted, or man-portable, short-range air defense units are the most suited to movement and maneuver along the jungle's limited LOCs and restricted terrain.

3-123. Jungles normally provide good concealment from the air which may reduce air defense requirements. The jungle concealment afforded to maneuver forces decreases the likelihood that enemy air will attack them. Densely forested areas increase the effectiveness of passive air defense measures, such as camouflage and dispersion. More often the enemy directs air attacks against base complexes, airfields, and logistical facilities. Exposed areas, such as clearings, roads, or river crossings, and facilities where troops tend to concentrate, such as supply points and headquarters, require air defense artillery protection and should receive first priority for air defense in jungle operations.

3-124. Target acquisition is more difficult, and radars are less effective in the jungle. Air defense artillery gunners may not be able to see enemy aircraft until they fly over their position. Reaction times will be short, and many engagements will take place after crossover.

JUNGLE EFFECTS ON FIRE SUPPORT

3-125. Jungle terrain, vegetation, and the character of operations all affect how units employ fire support in the jungle. The operational and mission variables, such as the heights and density of vegetation, buildings, and terrain; numbers and concentrations of civilians; and protected infrastructure affect how Army/Marine Corps forces can employ fire support.

Acquisition and Engagement Ranges

3-126. Target acquisition in the jungle is challenging. Dense vegetation and thick overhead cover afford enemy forces ample cover and concealment, making target detection difficult. The few open areas offer short windows of opportunity for targeting maneuver forces in the open and require firing systems to act rapidly on targeting data to be effective. Counterfire via radar is effective; however, sharp relief and masking terrain can make it more difficult to employ.

3-127. Poor weather, heavy vegetation, and limited observation ranges in the jungle hinders target identification, laser designation, and guidance for aerial and joint fires. The proximity of friendly units and noncombatants requires units to agree on, thoroughly disseminate, and rehearse clear techniques and procedures for marking target and friendly locations. The ability for ground units to "talk-on" aircraft using a common reference system helps expedite aerial target acquisition and mitigates potential fratricide.

3-128. To detect, acquire, and engage enemy maneuver forces in the jungle, commanders focus intelligence, surveillance, and reconnaissance (known as ISR) efforts on likely or known avenues of approach.

Commanders recognize the tendency for mountainous terrain to compartmentalize forces and canalize movement. As such, they focus collection efforts and designate pre-planned targets along natural lines of drift, such as LOCs, streams, rivers, valleys, and open areas.

3-129. Commanders meet target acquisition challenges by integrating and layering reconnaissance capabilities and systems. These capabilities include SOF, manned aircraft systems, UASs, EW, radars, and reconnaissance assets. Staffs must carefully plan for the placement and security of forward observers, joint fires observers, and joint terminal attack in support of targeting priorities. Staffs consider using more artillery systems, and dispersing these systems across a wider area, to ensure the responsiveness (rather than the weight) of fires.

3-130. The jungle's dense vegetation and thick canopy offer little time for Soldiers/Marines on the ground to distinguish friendly from enemy aircraft. While some automated digital systems assist with identifying fixed-, rotary-, and tilt-rotor aircraft, those systems are usually only available to specialized air and missile defense systems. The Soldier/Marine on the ground will have to rely on basic aircraft recognition methods to discern friendly aircraft from enemy aircraft. Leaders train Soldiers/Marines to recognize enemy and friendly airframes from various angles, identify distinguishing markings on aircraft, and spot modifications to airframes that differentiate common aircraft used by multiple parties.

Positioning

3-131. To best support dismounted maneuver forces operating across wide areas, commanders disperse field artillery assets across the AO where they can provide responsive fire support. Characterized by meeting engagements, ambushes, and movement to contact, requests for fire support during jungle operations are unanticipated and require rapid reaction by field artillery units to deliver effective fires. Dispersing artillery systems across the AO facilitates this rapid support by enabling units to establish more direct sensor-to-shooter links. However, commanders ensure that units are positioned for mutual defense as thick vegetation increases vulnerability to ground attack. Field artillery units often establish firing positions, or firebases, on high ground to improve the effectiveness of fire direction radar assets and mitigate the effects of steep terrain.

3-132. Reconnaissance is critical to identifying appropriate firing positions for artillery units operating in the jungle. Soft or saturated soil, steep slopes, lack of overhead clearance, and masking by trees and terrain complicate the positioning of fires assets. In an area where no suitable firing positions are known to exist, an engineer representative should accompany the fires reconnaissance party when identifying firing positions. Engineers can improve terrain when units must establish firing positions on poor terrain. (For more information on reconnaissance, selection, and occupation of a firing position, refer to ATP 3-09.50 or MCTP 3-10E [MCWP 3-16.1].)

Munitions

3-133. The type and quantity of munitions used in the jungle environment differs from other environments based upon the operational and mission variables; the requirements for precision-guided munitions is generally lower. Low population density and limited infrastructure in the jungle lead to fewer collateral damage concerns and fewer restrictions on the use of unguided munitions and munitions with larger effects. When required by mission, enemy, terrain and weather, troops and support available—time available and civil considerations (METT-TC)/(mission, enemy, terrain and weather, troops and support available—time available) METT-T, troops can use precision-guided munitions to mitigate collateral damage, negate danger close risks, engage moving targets, and destroy high-value targets. However, dense foliage may limit the use of laser guided munitions. Dense foliage can limit the laser designators ability to illuminate a target so it can be acquired by the guidance section of a warhead during terminal guidance.

3-134. Commanders exercise care when employing submunitions in the jungle. The use of submunitions on soft or saturated soil increases the dud rate, which may impact future movement and maneuver and increase the risk of collateral damage.

Munitions Effects

3-135. Commanders consider the following when requesting indirect fire support in the jungle:

- Proximity and super quick fused rounds lose much of their effect when fired into areas with dense tree canopies by exploding in the treetops.
- Delay fuses give better effects in heavy vegetation. The fuse triggers in the treetops but detonates the round in the air at a lower level. However, when used against troops in areas with soft, saturated soil, and no canopy to trigger the fuse overhead, delay rounds will bury themselves in the ground and lose their antipersonnel effect.
- Time fused rounds are not as effective in jungles with thick canopies due to the fuse impact function. Time fuses however work very effectively when used for close defensive fires—within 980 to 2,600 feet (300 to 900 meters)—with high-explosive munitions.
- In low canopy jungles, airbursts can increase casualty causing effects by creating dangerous shrapnel from the destroyed canopy. As bursting munitions thin out the tree canopy, troops may need to switch to proximity fuse or time fuse if they want airbursts as the method of attack.
- Units avoid using super quick fuses in muddy or saturated terrain, such as swamps or rice fields. Mud and saturated soil absorb the blast, and then direct shell fragments up instead of out, thereby limiting the casualty-producing effects.

3-136. Humidity may degrade the ability of propellant to achieve desired ranges. Troops employ measures to keep powder increments dry by—

- Covering and protecting munitions from rain and other forms of precipitation.
- Storing munitions off the ground in well-ventilated areas.
- Rotating stocks and firing older munitions before firing newer stocks.

Observation

3-137. Ground observation in the jungle is limited by sharp terrain and dense vegetation. These limitations impede ground observers' ability to locate and identify targets as well as their ability to positively identify adjacent friendly units or even their own location. These restrictions increase the risk of fratricide. When available, units employ aerial observation, including joint terminal attack controllers, to direct and observe indirect fires from the air. (For more information on observed fires, refer to ATP 3-09.30.)

Mobility

3-138. Bad weather, lack of roads, and restrictive terrain may impair the mobility of field artillery units. If units use roads for movement, they must prepare properly. Roadsides may lack adequate room for firing positions during road movements. Road movement requires ground security forces, supporting artillery, and attack aviation or CAS to provide protection and fire support. Units may also require engineer support to clear and maintain roads and to prepare adequate landing zones if they must move artillery by air.

Survey

3-139. Line-of-sight limitations severely hamper survey operations. Target area survey may be virtually impossible. Common grid reduces the amount of survey error between firing units and is required to accurately mass fires. However, accurate survey data may not always be available due to mission variables. Registration can eliminate errors in firing caused by a lack of survey control, but registration may not be possible or practical due to security or ammunition requirements. Consequently, effective battery leaders proficiently implement hasty survey techniques presented in ATP 3-09.50 and MCRP 3-10E.3 (MCWP 3-16.3).

Battery Defense

3-140. Because of their limited self-defense capabilities, artillery units are co-located with another unit for mutual defense or are augmented with a security element if available. When possible, cannon artillery array their howitzers in a star formation for 360-degree defensive coverage. However, due to terrain restrictions, units can use a lazy "W" or variation thereof. Leaders need to plan for additional security in the form of fire support provided by adjacent artillery and mortar units. When co-located or augmented by a security element, the battery's howitzers, FDC, and tactical operations center form an inner perimeter with the security element

occupying the outer perimeter. Each howitzer has an assigned sector for direct fire annotated on a range card with the data necessary to engage targets within the assigned sector.

3-141. Leaders can improve battery defense by co-locating one mortar tube with the battery. The mortar can provide close-in illumination and close indirect fire support. As soon as possible, howitzer positions should be parapeted, vital installations dug-in, and fighting and sleeping positions prepared.

Note. Battery defense is presented in more detail in ATP 3-09.50 or MCRP 3-10E.3 (MCWP 3-16.3).

Adjustment of Indirect Fire by Sound

3-142. Leaders ensure troops adjust indirect fire by in a jungle environment when they cannot obtain line of sight with the impacting munitions. Paragraphs 3-143 through 3-148 discuss techniques as effective in the adjustment of rockets, artillery, mortars, and aerial fires.

DANGER

Adjustment by sound does not allow for positive identification of the target. It must only be used when clearly approved in the rules of engagement or with explicit command approval. The observer must alert the fire direction center (FDC) when adjusting by sound.

3-143. The basic principle of adjustment by sound is that the direction and distance to the target are known, and the observer can calculate direction and distance to the explosion of the round from the sound of the explosion. The observer compares data points to determine the appropriate correction in deviation and range. A problem encountered in this method occurs because the heavy foliage distorts sound and makes it difficult to determine range or lateral shift corrections.

3-144. Upon hearing the burst of the adjusting round, the observer estimates the direction to the burst and compares it with the direction to the target, then converts the deviation to a lateral shift, in meters (using estimated range to the target). Distance to the adjusting point is difficult to judge; therefore, the observer may have to use a creeping technique to adjust onto the target. The observer can determine distance by measuring the time it takes for the sound to be heard and multiplying the time interval by the speed of sound (1,148 feet [350 meters] per second). To help the observer determine distance accurately, the fire direction center (FDC) must announce the precise moment of impact. There is a distinct technique used to determine the correction in deviation and range.

CAUTION

The observer must use caution in very broken terrain. In hills and mountains, sound may travel around a hill before it arrives at the observer's position and may produce a false direction to the burst.

Correction in Deviation

3-145. The direction from the observer to the target is measured from a map or by compass. The observer measures the direction to the explosion with a compass. These two azimuths, expressed in mils, form an angle as illustrated in figure 3-4.

Note. Degrees may be substituted if necessary.

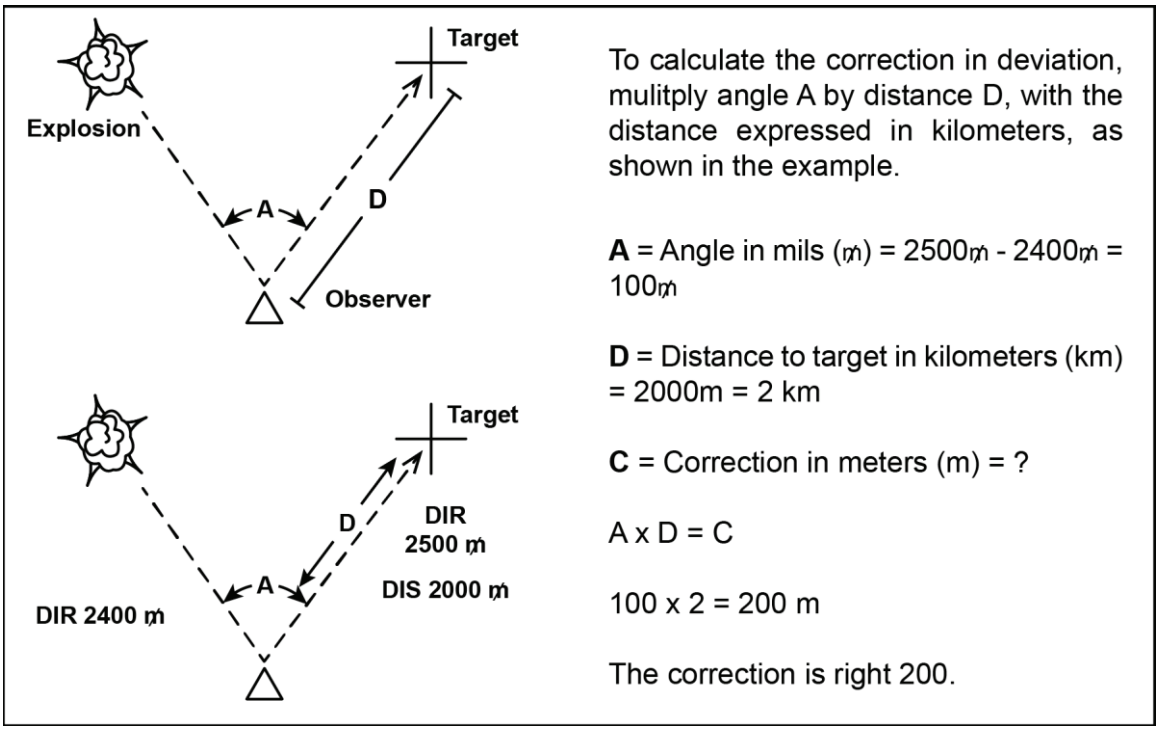


Figure 3-4. Computing the correction in deviation

Correction in Range

3-146. The observer can measure or estimate the distance from the target on a map. The distance to the explosion of the round is calculated by counting the number of seconds from the impact of the projectile until the observer hears the explosion. The observer multiplies the number of seconds by the speed of sound, 1,148 feet (350 meters)/second and then adds or drops the resulting distance, as appropriate.

3-147. To tell the observer when the round impacts, the FDC provides "splash and count." In splash and count, the FDC sends, "Splash four, three, two, one—impact." On the word "impact" the round lands, and the observer starts counting the seconds until they hear the explosion. See figure 3-5 on page 3-28 for an example of computing correction in range.

Note. When requesting unobserved fire support, the observer must request a splash and count from the FDC by stating “cannot observe, splash and count” during the call for fire. The FDC does not normally provide a splash and count when providing observed fire support.

Other Considerations

3-148. Because the impact is unobserved, adjusting fire by sound does not provide adequate information on whether the right fusing was used during the fire mission. Because the height and density of vegetation and the surface composition may prevent rounds from detonating effectively, troops may require a combination of quick fuses and delay fuses when adjusting fire by sound. (For more information on call for fire and unobserved fires see ATP 3-09.30.)

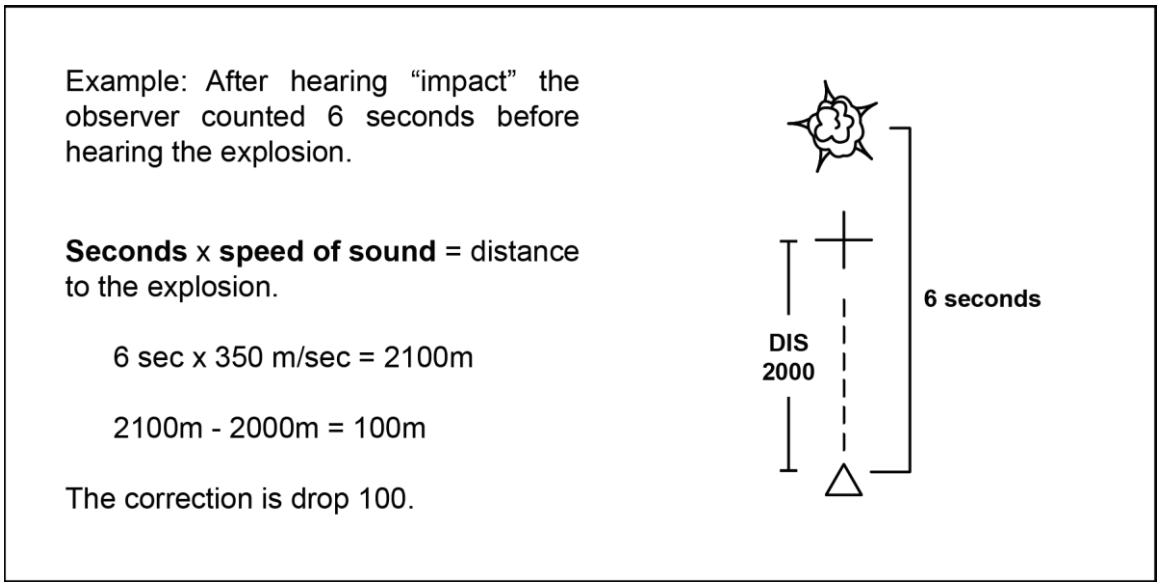


Figure 3-5. Computing the correction in range

SUSTAINMENT/LOGISTICS WARFGHTING FUNCTION

3-149. *Logistics* is planning and executing the movement and support of forces (JP 4-0). The Marine Corps amplification is all activities required to move and sustain military forces. Logistics is one of the warfighting functions (MCRP 1-10.2). The *sustainment warfighting function* is the related tasks and systems that provide support and services to ensure freedom of action, extended operational reach, and prolong endurance (ADP 3-0). Commanders conducting sustainment/logistics in support of unified land operations must understand the diverse requirements of the supported formations and environmental challenges of conducting operations in a jungle environment.

3-150. The Army identifies four elements of the sustainment warfighting function: logistics, financial management, personnel services, and health service support. The Marine Corps classifies logistics elements into six functional areas: supply, maintenance, transportation, general engineering, health services, and other services. These other services include legal, exchange, food service, disbursing, postal, billeting, religious, mortuary, and morale and recreation services.

3-151. Sustainment/logistics maintains operational momentum by delivering supplies and services as far forward as possible. Sustainment/logistics commanders must act, rather than react, to support requirements. The existence of habitual support relationships facilitates the ability to anticipate requirements.

3-152. U.S. forces in the jungle operate at the end of a long, complicated, and potentially tenuous LOC. Inherent to the success of any tactical operation is continuous sustainment/logistics planning and responsive support. The jungle environment challenges every element of the sustainment warfighting function. Commanders identify the challenges, and the logistician must work to overcome them. A unit's tactical effectiveness in the jungle depends on the sustainment/logistics availability of supplies. However, a formation's largest vulnerability lies in its exposed LOCs and the immobility of its bases of supply and support.

3-153. The lack of resources and infrastructure in the jungle poses a significant challenge for logisticians. The lack of ports, airfields, railways, and improved roads limit the capacity for sustainment throughput. The potential lack of locally available potable water places increased demands on water purification, transportation, and storage assets. Additionally, the environment can severely affect equipment, requiring increased levels of maintenance support to maintain equipment readiness and serviceability. The limited number of improved LOCs capable of functioning as main supply routes (MSRs) or alternate supply routes (ASRs) require frequent repair and maintenance due to heavy use. The limited number of LOCs also require

careful management by movement control teams to synchronize movement and maintain responsive sustainment support.

3-154. Mobility and transportation restrictions may require logisticians to improvise methods of resupply. Aerial resupply, the use of pack animals, and human portage work as proven methods of resupply in restrictive terrain.

3-155. Characterized by unpredictable, small-unit combat, the security threat during jungle operations requires that troops frequently patrol LOCs and escort convoys. To mitigate challenges associated with securing extended LOCs, units perform sustainment activities as far forward as the tactical situation permits. This not only improves response time but also reduces road movement and allows sustainment forces to take advantage of the security offered by combat units.

MAINTENANCE, REPAIR, RECOVERY, AND BATTLE DAMAGE ASSESSMENT AND REPAIR

3-156. Maintenance involves all actions taken to retain materiel in a serviceable condition or to restore it to serviceability. For the Marine Corps, maintenance includes inspection, testing, servicing, and classification as to serviceability, repair, rebuilding, and reclamation. It is all supply and repair action taken to keep a force in condition to carry out its mission. (See MCTP 3-40E for more on maintenance.) The Army's two levels of maintenance are field maintenance and sustainment maintenance. The Marine Corps utilizes three categories of maintenance: organizational, intermediate, and depot. (For more information on maintenance, see ATP 4-33 and MCTP 3-40E.)

3-157. The high humidity and temperatures prevalent in jungle areas will increase maintenance requirements. Preventive maintenance on any item affected by moisture and heat is extremely important. For more responsive maintenance support, increase the quantity of repair parts in shop stock and bench stock that deteriorate under high temperature and high humidity conditions.

3-158. To maintain operational readiness rates, Soldiers/Marines repair disabled equipment as close to the site of damage as the tactical situation and available resources permit. Troops can make these repairs by using aviation assets to transport maintenance contact teams and repair parts to the point of need. Evacuation should be limited when possible.

3-159. Due to the dispersed nature of jungle operations, field maintenance personnel and contact teams will likely be distributed throughout the AO. Because many small units may lack field maintenance personnel, vehicle crews train to make as many adjustments and repairs as they can. General guidelines for jungle repair:

- Repair only what is necessary to make the equipment combat effective.
- Recover disabled equipment to the nearest secure site and conduct on-the-spot repair.

3-160. SOPs for recovery and repair ideally include—

- Guidelines for crew-level recovery and battle damage assessment and repair (BDAR).
- Criteria for recovery by forward maintenance teams.
- Criteria for recovery by field maintenance personnel.
- Priorities for recovery by vehicle type.
- Limitations on field expedients. For example, the distance or time over which one tank is allowed to tow another tank considering the heat buildup in the transmission in a hot jungle environment.
- Methods for the recovery and repair of signal, EW, and communications equipment.
- Methods and protocols for the destruction of damaged sensitive equipment, such as signal, command and control, or communications equipment.
- Methods of security for recovery teams.

3-161. BDAR is the procedure used to rapidly return disabled equipment to the operational commander by field-expedient repair of components. BDAR restores the minimum-essential combat capabilities necessary to support a specific combat mission or to enable the equipment to self-recover. Troops accomplish BDAR by bypassing components or safety devices, cannibalizing parts from like or lower priority equipment, fabricating repair parts, jury-rigging, taking shortcuts to standard maintenance, and using substitute fluids, materials, or components. Operators and crew, maintenance teams, or recovery teams may perform BDAR. (See ATP 4-31/MCRP 3-40E.1 [MCRP 4-11.4A] for more information on recovery and BDAR.)

DISTRIBUTION

3-162. Commanders use throughput distribution and preconfigured packages of essential items to help maintain operational momentum and tempo in the jungle. Logistics units and materiel remain close to a maneuver force to ensure short turnaround time for supplies and services. This includes uploading as much critical materiel—such as petroleum, oils, and lubricants (known as POL) and ammunition—as possible.

3-163. The diverse terrain, weather, and vegetation in the jungle affect the organization, stationing, and security considerations for sustainment units. If available, aerial resupply works effectively for resupplying small units in the jungle. The responsiveness provided by aerial resupply requires small units to stockpile fewer supplies in the combat trains. With fewer supplies required on hand, the combat trains may only consist of medics, a maintenance element, and small amounts of rations, ammunition, and lubricants. The remainder of the logistical assets will be located in the support area, to include petroleum, oils, and lubricants; most vehicles; stockpiled ammunition and other ordnance items; the aid station; rations; maintenance contact teams; and water purification equipment.

3-164. The availability of adequate supplies and transportation to sustain an operation becomes more critical with certain conditions. These condition include the operation progresses, units move away from existing road and trails, the supply LOCs lengthen and become more complicated, the quantity of petroleum, oils, and lubricants required to move supplies increases, and the requirements for repair and replacement of weapon systems increase. Sustainment units in direct support of maneuver units must be as mobile as the forces they support which is extremely challenging when conducting dismounted maneuver in the jungle environment. Commanders may need to task-organize sustainment units to provide the proper support to dismounted maneuver forces at the point of need.

3-165. The jungle offers excellent terrain for concealment, defilade, and dispersion. Trains position far enough forward to respond quickly, yet far enough to the rear to have minimum exposure to the enemy. If the majority of resupply is done by air, the combat trains may be located with the field trains in the brigade support area. If possible, units locate all trains near landing zones. Field, combat, and company trains position close to LOCs, which units sometimes use as an alternate method of resupply. If none of these are available, then units may need to construct landing zones and supply routes.

3-166. Securing the support area can prove challenging in the jungle as enemy infiltration into the rear area is a constant threat. Within a division or corps support area, a designated unit, such as a maneuver enhancement brigade, provides area security, terrain management, movement control, mobility support, and clearance of fires. At brigade and below, the support area gets security from assets internal to the brigade.

Wheeled and Tracked Vehicles

3-167. Wheeled vehicles are normally restricted to roads and wider trails, and even these may prove impassable during heavy rains. In areas with significantly restrictive terrain, supplies may need to be cross-loaded from wheeled to tracked vehicles at certain points in the distribution network. After wheeled vehicles transport the supplies as far forward as possible, troops load supplies onto tracked vehicles capable of moving them across unimproved terrain and LOCs. In extremely difficult terrain, troops may need to further trans-load supplies to pack animals or human porters to complete the distribution.

Inland Waterways

3-168. Inland waterways provide an important part of the transportation system in remote areas. Large rivers may enable small watercraft to penetrate several hundred miles inland. Where smaller streams branch out, a unit may establish transfer points for the trans-loading of cargo into smaller watercraft. A river that is normally very shallow during the dry season will be deeper during the rainy season, permitting travel by larger craft. A unit should establish supply points high enough above the water line to prevent damage in the event of rapidly rising water levels.

Fixed-Wing Transport Aircraft

3-169. Fixed-wing aircraft can travel greater distances without refueling than rotary-wing aircraft. However, use of fixed-wing aircraft to transport supplies requires more landing strips than may be present.

Construction and maintenance of airfields in jungles is a difficult task, but open savanna may be large enough and firm enough to use as an airstrip.

3-170. Airdrop of supplies is an alternative to air-landing. Airdrop by parachute is a rapid means of delivery and makes deliveries to isolated units possible without further trans-loading. Disadvantages of airdrop include the dispersion of supplies and the possibility of lost cargo in the jungle canopy, vulnerability to local enemy air defense, and a requirement for local air superiority.

3-171. A variation of airdrop by parachute is the low altitude parachute extraction system. The parachute is used to pull the load from the rear ramp of an aircraft flying at a reduced speed only 3 to 6 feet (1 to 2 meters) above the ground. Low altitude parachute extraction negates the issues of dispersion and the challenges caused by thick canopies and capitalizes on the smaller drop zones more common in jungle areas. However, fragile equipment might not survive this type of drop. In areas where aircraft can make a low-level approach, such as savannas, low altitude parachute extraction may be a valuable resupply technique. Only C-130 aircraft perform this airdrop.

3-172. The container parachute delivery system provides single pass delivery of 1 to 16 individually rigged A-21 containers into a small drop zone at altitudes of 500 to 600 feet (152 to 182 meters). When using this system, the selection of a drop zone is critical to accurate delivery. The jungle terrain and the small drop zones make the accurate delivery of bundles challenging. The drop zone must measure at least 1,300 feet by 1,300 feet (400 meters by 400 meters). A container parachute delivery can use a straight stretch of road or a large field visible from the air. If no open area exists, troops may use a river or lake. If dropped in the water, bundles must be rigged with adequate buoyancy (for example, empty water cans). To prevent loss, troops must recover the bundles immediately upon completion of the drop.

3-173. Rotary- and tilt-wing aircraft can also deliver small loads of supplies and equipment using either a low opening parachute or a free drop. In this method, pilots simply drop the load, with or without a small parachute, from a low and slow flying helicopter or tilt-wing aircraft. Helicopters work very well employing this technique because they can hover low over a unit and drop the supplies exactly where desired.

3-174. Specialized unmanned aerial vehicles, both rotary and fixed wing, can be used to resupply remote locations with limited quantities of critical supplies. These specialized unmanned aerial vehicles can be used in weather conditions and threat conditions that prevent manned aircraft operations.

SUSTAINMENT/LOGISTICS PLANNING

3-175. The commander's intent and analysis of the mission variables is used to determine the sustainment plan. However, sustainment planners must not become locked into rigid sustainment plans as the situation dictates how trains are configured, echeloned, and controlled. Commanders and their staffs must use a logical and efficient means to evaluate changing conditions and reach decisions. The MDMP/MCPP described in FM 6-0 and MCWP 5-10 (MCWP 5-1) provides the framework within which the commander and staff interact to develop the sustainment plan.

3-176. Sustainment commanders and planners must thoroughly understand the mission and the commander's intent. They must know—

- What each of the supported elements will be doing:
  - When they will do it.
  - How they will do it.
  - Where they will do it.
- What the priority of support is.
- Density of personnel and equipment being supported.

3-177. The commander and staff develop a concept of support/concept of logistic support that applies resources against requirements in a manner that results in the most responsive support possible. They establish and maintain communications links and orders that clearly describe tasks to be performed. Continuous follow-up ensures tasks are performed as planned.

3-178. Sustainment support must be responsive and is planned around the concept of providing support as far forward as possible. This involves bringing ammunition, fuels, parts, end items, maintenance personnel,

and occasionally replacement crews or individuals, to the forward elements such as battalion field trains, combat trains, and equipment down sites.

3-179. A key to successfully extending operational reach is the ability to anticipate the requirement to push sustainment support forward, specifically ammunition, fuel, replacements, and water. Sustainment commanders must act, rather than react, to support requirements. The existence of habitual support relationships facilitates accurate anticipation of support requirements.

FORECASTING

3-180. Due to the extended LOCs and the difficulty of transportation, accurate consumption estimates are critical during jungle operations. Commanders need to adjust standard Class I, III, and V consumption estimates to account for the restrictive terrain and environmental factors. The absence of roads in forward areas, navigation problems, weather impacts, and wide dispersion all require careful consideration when forecasting resupply requirements and operations.

HEALTH SERVICES

3-181. Medical support during jungle operations follows the basic principles of military medicine, but medical treatment and evacuation is often complicated by extended LOCs and inaccessibility due to terrain and vegetation. The incidence of illness from heat, exposure, and vector-borne disease is higher than in temperate climates and requires increased preventive medicine emphasis on health and sanitation. The mobility of maneuver units is impacted if any part of these units, including the combat trains, is restricted by having to treat numerous and repetitive environmental injuries.

3-182. Although difficult, timely evacuation of sick and wounded Soldiers/Marines is critical during jungle operations as the prevalence of tropical diseases increases the risk of infection. Units use all available methods to augment organic medical evacuation and aid in the speedy movement of casualties to enhanced roles of medical care. These may include tracked vehicles, pack animals, watercraft, rotary-wing aircraft, and litter bearers.

3-183. The difficulties of overland medical evacuation in jungle operations emphasize the advantages of air evacuation. When weather, aircraft availability, and friendly air superiority permit their use, rotary-wing aircraft provide fast, comfortable, and efficient transportation for casualties. Decreasing the time it takes to evacuate casualties to more advanced medical care drastically increases survival rates and can improve unit morale. A rotary-wing aircraft equipped with a cable hoist and jungle penetrator can evacuate casualties from thick jungle vegetation where no landing zones exist. Combat losses attributable to slow evacuation time can also be reduced by having adequate medics/corpsmen and tactical combat casualty care certified Soldiers/Marines near the point of injury.

3-184. In remote jungles with thick foliage and dense canopies, ground transportation by litter may be the only means of casualty evacuation. This slow and exhausting task requires well-conditioned troops to carry the litters. There are several types of litters. In very rugged terrain, the mountain-type metal basket litter offers the most security to the patient. However, it is cumbersome and difficult to carry during dismounted operations. The standard folding litter, SKEDCO, or field expedient variations are less bulky and effective if troops move patients with great care.

MORTUARY AFFAIRS

3-185. Extended LOCs and restrictive terrain make evacuating deceased Soldiers/Marines difficult. Commanders develop mortuary affairs plans before initiating jungle operations. Commanders and staff developing mortuary affairs plans for jungle environments consider that the hot and humid climate increases decomposition rates and poses a direct challenge to preservation efforts. The remains of deceased are transported in palletized transfer cases when the tactical and logistical situation permits. Additional refrigeration equipment or facilities may be required to properly store the deceased. (For more information on mortuary affairs, refer to ATP 4-46.)

3-186. When the situation prohibits immediate evacuation, troops may have to inter remains temporarily within the theater. Interments may only be conducted as a last resort and after being approved by the

geographic combatant commander. Careful consideration must be given to selecting appropriate sites for temporary interment as changing weather and precipitation can rapidly affect burial sites.

3-187. Host-nation (HN) support can be used to dig and fill temporary interment sites; however, HN support laborers will not handle or process the remains or personal effects of U.S. personnel. Personal effects will be interred with remains to help in the identification of remains when they are disinterred. The mortuary affairs company commander has responsibility for the layout, survey, and recording of the interment site.

CAPTURED MATERIEL

3-188. Units operating in the jungle may use captured supplies to reduce their reliance on extended LOCs and limited transportation assets. Army/Marine Corps forces may use captured Class III after testing to confirm they have not been polluted or sabotaged. U.S. forces can use captured Class I and Class VIII supplies to feed or treat enemy prisoners of war, but U.S. forces do not consume or use these items. Despite the potential for using captured supplies to support enemy prisoner of war operations, commanders and staff must still plan to provide health services, transportation, shelter, and Class I in the absence of captured materiel.

ENVIRONMENTAL CONSIDERATIONS BY CLASS OF SUPPLY

3-189. Conditions in the jungle impact the use, storage, and consumption of various classes of supply and require adjustments to planning and forecasting to sustain operations.

Class I — Subsistence

3-190. A force's ability to store and transport food and water is key to conducting operations in the jungle. The organic water transportation and storage capacity of a unit usually does not meet its needs during jungle operations. Possible solutions include converting fuel tankers to water tankers, using blivets, and making local purchases of civilian water holding tanks through HN support. A quality water-filtration system can allow patrols to hydrate without the excess burden of carrying too much water. Commanders establish priorities for water use through orders or unit SOPs. See paragraphs 1-96 through 1-111 for more information on water storage techniques, water supply planning, and water requirements during jungle operations. (For additional doctrine on planning and executing water support operations see ATP 4-44/MCRP 3-40D.14 [MCRP 3-17.7Q] and MCRP 3-40B.5 [MCWP 4-11.6].)

Class III – Petroleum, Oils, and Lubricants

3-191. Class III considerations include bulk and packaged fuel and lubricants. Increased humidity and precipitation increase the demand for oils and lubricants used during preventive maintenance. However, because of the dispersed nature of operations in the jungle, troops package oils and lubricants in small containers to enable transport and accessibility by small units across the theater. Packaged lubricants are less prone to contamination by frequent movement and repetitive use.

3-192. Commanders make additional considerations for storing and transporting fuel during jungle operations. Road surface conditions in the jungle may reduce or degrade a loaded fuel tanker's cross-country capability, and infrastructure limitations may require tankers to transport less than their maximum capacity. Under these conditions, units may have to use fuel depots and rely on fuel cans, bladders, or auxiliary tanks to transport and store fuel. The use of many small fuel depots is conducive to the dispersed nature of jungle operations. However, units must implement safeguards to prevent enemy forces from capturing or sabotaging friendly fuel supplies. To determine fuel estimates, units divide the required distance to travel (in miles) by the vehicle's miles per gallon. This number is then multiplied by the number of vehicles present to determine the total fuel requirement. Miles per gallon for specific vehicle models can be found in the vehicle's technical manual. (For more information on petroleum supply, see ATP 4-43 and MCRP 3-40B.5 [MCWP 4-11.6].)

3-193. High temperatures increase the demands on vehicle cooling systems and, in turn, cause an increase in the consumption of coolants. Sustainment planners increase the volume of coolant maintained on hand and distribute small amounts of coolant to vehicle crews for contingencies. Overheating may cause engine seals to break down and result in oil leaks. Sustainment planners consider increasing the amount of oil distributed

to vehicle operators during jungle operations. Repetitive overheating causes excessive wear that can ultimately lead to engine failure.

Class IV – Construction Materials

3-194. The requirement for Class IV stores can be significantly lower in the jungle than in other theaters due to the large amounts of locally available resources. Maximum use must be made of local materials in order to reduce demands on transportation assets.

Class V - Ammunition

3-195. Class V consists of ammunition of all types, including bombs, explosives, mines, fuses, detonators, pyrotechnics, missiles and rockets. Battalion trains maintain a one-day supply of ammunition and missiles for all weapons systems in the unit. When trains are echeloned, combat and field trains divide ammunition. Units should keep ammunition as packaged until it can be uploaded on combat vehicles or issued to individual Soldiers. This will protect the ammunition from damage caused by high heat, humidity, and precipitation.

Class VIII – Medical Material

3-196. Class VIII consists of medical items, medical repair parts, blood, and fluids. During jungle operations, units require medicines to both prevent and treat diseases endemic to tropical environments, such as malaria, and diseases caused by poor sanitation, such as dysentery.

Class IX – Repair Parts and Components

3-197. The high heat, humidity, and precipitation of the jungle increase demands for repair parts. Maintenance supervisors should increase on-hand quantities of frequently used shop stock or bench stock lines. Troops maintain small items with high usage rates as far forward as possible; some troops keep those items on individual vehicles.

PROTECTION/FORCE PROTECTION WARFIGHTING FUNCTION

3-198. *Protection* is the preservation of the effectiveness and survivability of mission-related military and nonmilitary personnel, equipment, facilities, information, and infrastructure deployed or located within or outside the boundaries of a given operational area (JP 3-0). *Force protection* is preventive measures taken to mitigate hostile actions against Department of Defense personnel (to include family members), resources, facilities, and critical information (JP 3-0). The Marine Corps amplification is actions or effects used to safeguard own centers of gravity while protecting, concealing, reducing, or eliminating friendly critical vulnerabilities. Force protection is one of the warfighting functions (MCRP 1-10.2). The *protection warfighting function* is the related tasks and systems that preserve the force so the commander can apply maximum combat power to accomplish the mission (ADP 3-0). During jungle operations, the bulk of protection activities consist of survivability, air and missile defense, and CBRN operations.

3-199. Protection/force protection emphasizes the need for Soldiers/Marines, leaders, and organizations to identify, prevent, and mitigate threats and hazards. The environmental hazards and impacts on personnel and equipment in the jungle increase the challenges associated with generating and maintaining combat power. The lethality of jungle operations requires synchronization, integration, and organization of capabilities and resources to preserve combat power through continuous protection/force protection.

3-200. Although traditionally used to allocate air and missile defense resources to protect critical assets, commanders can expand the concept of the CAL and DAL to account for non-air defense related threats and assets that require protection. Assets deemed not vulnerable to air and missile attack may still require protection from sabotage or ground attack, and commanders can expand the CAL to account for these assets. They can then apply other security forces, such as military police, to protect these critical assets.

SURVIVABILITY

3-201. *Survivability* is all aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy (JP 3-34). The Marine Corps amplification is the degree to which a system is able to avoid or withstand a man-made hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission (MCRP 1-10.2). The Army defines *survivability* as a quality or capability of military forces which permits them to avoid or withstand hostile actions or environmental conditions while retaining the ability to fulfill their primary mission (ATP 3-37.34/MCTP 3-34C).

3-202. Survivability operations enhance the ability to avoid or withstand hostile actions by altering the physical environment. Avoidance measures seek to prevent an enemy attack; measures implemented to withstand an attack seek to preserve readiness and mitigate the effects of an enemy attack. Units conduct risk management to enhance survivability. Risk management requires identifying and assessing the threat, criticality, vulnerability, and ultimately risk. As a continuous process, it results in the implementation of control measures to actively combat the threat and protect U.S. forces while enabling mission success. (See ATP 5-19 for more information on risk management.)

3-203. There are three general categories of threats to survivability: hostile actions, non-hostile activities, and environmental conditions. Although all three categories of threats can cause damage, destruction, death, or injury to personnel and physical assets, survivability focuses on avoiding or withstanding threats posed by two of those categories: hostile actions and environmental conditions.

Note. Hostile actions and environmental conditions can sometimes overlap, making it difficult to distinguish between them. Hostile actions can affect environmental conditions, and their effects sometimes linger for significant periods, such as when CBRN weapons have been employed. In addition, threat forces and elements may, as a hostile action, create hazardous environmental conditions. For example, they may set forest fires or create flooding by destroying a dam. Regardless of whether a particular threat is categorized as a hostile action, an environmental condition, or both, the capability to avoid or withstand such a threat is critical to the survivability of military forces.

3-204. Commanders increase survivability by ensuring all Soldiers/Marines have, and properly use, the necessary protective equipment to mitigate hazards of the jungle battlefield. Commanders ensure that Soldiers/Marines have standard protective equipment, such as helmets, gloves, body armor, eye protection, and chemical protective over garments. Commanders ensure availability of other protective equipment and materials such as—

- Knee and elbow protectors.
- Barrier materiel, including pre-formed concrete barriers, wire, and sandbags.
- Fire extinguishers and other firefighting equipment.

SURVIVABILITY OPERATIONS

3-205. Survivability operations seek to enhance naturally occurring qualities or capabilities to improve a person, unit, or asset's ability to avoid or withstand hostile actions. For example, one way to enhance survivability—when existing terrain features offer insufficient cover and concealment—is to alter the physical environment to provide or improve cover and concealment. Similarly, natural or artificial materials may be used as camouflage to confuse, mislead, or evade the enemy. Together, these are called *survivability operations*—those protection activities that alter the physical environment by providing or improving cover, camouflage, and concealment (ATP 3-37.34/MCTP 3-34C). By providing or improving cover, concealment, and camouflage, survivability operations help military forces avoid or withstand hostile actions. Although such activities often have the added benefit of providing shelter from the elements, survivability operations generally focus on preventing or mitigating enemy acts.

Engineer Role in Survivability Operations

3-206. Although all units conduct survivability operations within the limits of their capabilities, the Army/Marine Corps has a broad range of diverse engineer capabilities that can enhance survivability. Engineering tasks in support of survivability operations include tasks to build, repair, or maintain fighting and protective positions; harden, conceal, or camouflage roads, bridges, airfields, and other structures and facilities; construct protective works for explosive hazards; and clear routes and areas of explosive hazards. These tasks tend to be equipment intensive and may have to be prioritized by criticality of the site or asset given potential equipment constraints. Commanders base the priority of engineering support on the mission variables, threat, and commander's intent.

Jungle Survivability Positions

3-207. Survivability operations enhance the ability to avoid or withstand hostile actions by altering the physical environment. They accomplish this by providing or improving cover, concealment, and camouflage in four areas. The first three areas address fighting positions, protective positions, and hardened facilities, focusing on providing cover (although not excluding camouflage and concealment). The fourth area addresses camouflage and concealment and focuses on providing protection from observation and surveillance. All four areas have the added benefit of providing some degree of shelter from the elements. The four areas of survivability operations are often addressed in combination. Fighting positions and protective positions, for example, usually also require camouflage and concealment. Camouflage and concealment activities often accompany activities to harden facilities.

3-208. Because the enemy can easily detect overly cleared areas, troops clear away only necessary vegetation to retain as much natural concealment as possible. In properly constructed positions, the Soldier/Marine is concealed from the enemy and protected by cover but still can detect approaching enemy.

3-209. The commander's responsibilities during construction of survivability positions:

- Protect troops.
- Continuously improve and maintain unit survivability.
- Provide materials.
- Periodically inspect.
- Plan and select fighting position sites.
- Get technical advice from engineers, as required.

3-210. Engineer activity often precedes operations, which makes it important that such work be concealed from enemy surveillance. Follow these guidelines to conceal engineer activity:

- Employ the minimum number of equipment and personnel.
- Conceal, disperse, and store construction equipment away from the construction site when not in use.
- Complete all possible preparations well away from the site.
- Follow the natural lay of the land when constructing fighting positions.

3-211. When constructing fighting positions in the jungle—

- Ensure adequate material is available.
- Dig down as much as possible.
- Maintain, repair, and improve positions continuously.
- Inspect and test positions daily, after heavy rain, and after receiving direct and indirect fire.
- Interlock sandbags for double-walled constructions and corners.
- Check stabilization of wall bases.
- Fill sandbags approximately 75 percent.
- Construct to standard (refer to TC 3-21.75 and GTA 05-08-001 for fighting position construction standards).
- Use common sense.

3-212. When constructing fighting positions in the jungle, do not—

- Use sand for structural support.
- Forget to camouflage.
- Drive vehicles within 6 feet (2 meters) of a position.
- Overfill sandbags.
- Build above ground unless absolutely necessary.

3-213. In a combat situation, sometimes troops need to improvise construction of a survivability position by using materials not normally associated with the construction. Some examples of field-expedient materiel include—

- Wall revetment:
  - Sheet metal.
  - Corrugated sheet metal.
  - Plastic sheeting.
  - Plywood.
  - 463L pallets.
- Wall construction (building up):
  - Sand grid material.
  - 55-gallon drums filled with sand.
  - Expended artillery shells filled with sand.
  - Shipping boxes and packing material.
  - Prefabricated concrete panels.
  - Prefabricated concrete traffic barriers.
- Overhead cover stringers:
  - Single pickets (“U” facing down).
  - Double pickets.
  - Railroad rails.
  - "T" beams.
  - Diameter pipe 2 inches (5 centimeters) or larger.
  - Timbers 2 inch x 4 inch, or 4 inch x 4 inch (5 centimeter x 10 centimeter, or 10 centimeter x 10 centimeter) or larger.
  - Reinforced concrete beams.
  - 55-gallon drums cut in half longitudinally.
  - Large diameter pipe or culvert cut in half.
  - Precast concrete panels, 6 to 8 inches (15 to 20 centimeters) thick.
  - Airfield panels.
  - 463L pallets.
  - Shipping pallets.
- Stand-alone positions:
  - Military vans or ISU-90s.
  - Cargo shipping containers.
  - Large diameter pipe or culvert.
  - Steel water tanks.
  - Other storage tanks (cleaned and ventilated).
  - Vehicle hulks (inspected and cleared of depleted uranium).

3-214. Troops use the following as a suggested inspection checklist when preparing survivability positions:

- Fighting position is sited in a tactically sound location.
- Fighting position is sited in an environmentally sound location. Considerations are made for water drainage and run-off during periods of heavy precipitation.
- Low profile is maintained.
- Quality construction materials are used.
- Walls are sloped in jungle conditions with unstable soil.
- Floor slopes from center to both ends.
- Grenade sump is present at both ends.
- The setback for overhead cover is a minimum of 1 foot (30 centimeters) or 1/4 the depth of cut.
- Stringers—
  - Are firmly on a structural support.
  - Have lateral bracing emplaced along supports.
  - Use 2 inch x 4 inch or 4 inch x 4 inch (5 centimeter x 10 centimeter, or 10 centimeter x 10 centimeter) stringers on the edge; the strength is on the depth of the lumber.
- Supports:
  - Stringers are firmly on supports.
  - Overhead stringers are at least 8 feet (2.4 meters) long to facilitate sloped walls.
  - Supports extend past the excavation by 1/2 the depth of cut.
- Revetments:
  - Quality of construction is checked.
  - Sheeting is supported by pickets.
  - Pickets are tied back.
- Overhead cover:
  - Quality of structural layer is inspected.
  - Quality of dust layer, plywood or panels, is inspected. Standard dustproof layer is 4 feet x 4 feet (1meter by 1 meter) sheets of ¾-inch plywood centered over the fighting position.
  - Overhead burst protection is at least 18 inches (45 centimeters) deep (preferably sandbags).
  - Overhead cover is waterproofed with plastic sheeting or a poncho.

Fighting Positions

3-215. A fighting position allows Soldiers/Marines and their weapon systems to engage and destroy enemy forces while avoiding or withstanding hostile actions. Although jungles have excellent concealment, the jungle fighter must still prepare fighting positions to get as much cover as possible. Such positions include individual, crew-served, and combat vehicle positions as well as bunkers. Fighting positions provide cover and concealment and, to be effective, they must also support the unit's defensive plan. This requires close integration with the concept of operations and its supporting schemes, particularly the scheme of movement and maneuver/scheme of maneuver and the scheme of fires.

3-216. Overhead cover provides protection from indirect fire, air burst munitions, shrapnel, and fragmentation. Overhead cover of at least 18 inches (45 centimeters) thick protects from shrapnel and air bust munitions. Sandbags resting on a dustproof layer of 3/4-inch (2 centimeters) plywood provide optimum overhead cover. However, troops fill sandbags only to 75 percent capacity to preserve the bag's integrity when used in layers. (To ensure adequate strength, consult ATP 3-37.34/MCTP 3-34C.) Inadequate construction material can collapse when struck by shell fragments.

3-217. To conceal the fighting positions, troops take advantage of the jungle's natural surroundings. When possible, they incorporate large fallen or standing trees and depressions into manmade fighting positions. Different types of wood, soil, and other materials provide varying degrees of protection. (See ATP 3-37.34/MCTP 3-34C for the thickness of dirt or sandbags needed for adequate protection.)

3-218. Although difficult, all positions should provide for drainage during tropical rainstorms. Troops position the floor to slope from the center of the position toward the grenade sumps. During the raining season, this positioning prevents immersion.

3-219. If time permits, troops build an elevated floor stand of saplings, gravel, or pallets so that they do not have to stand in mud or water. Grenade sumps must remain clear. Units achieve additional waterproofing with plastic garbage bags, ponchos or other waterproof fabric incorporated into the overhead cover. Jungle soils are soft and erode quickly during the rainy season. Revetments help prevent the walls of a position from caving in. Troops use anchor stakes to tie off revetments driven flush with the ground to prevent confusion with firing stakes.

Protective Positions

3-220. Protective positions protect the occupying personnel, vehicles, and equipment by enabling them to avoid or withstand hostile actions. As with fighting positions, protective positions provide cover, camouflage, or concealment (or a combination of the three). Unlike fighting positions, protective positions do not focus on providing a position from which to engage the enemy.

3-221. Command posts are probably the most difficult positions to conceal although their need for concealment is great. They require strict camouflage discipline. Commanders prohibit vehicles and aircraft to approach closer than absolutely necessary. Whenever possible, troops dig in the entire command post. They use engineer assets to build a berm around the perimeter, help break up the silhouette, and enhance security. They avoid placing other equipment too close to avoid drawing attention to the site. Troops dig in generators so they have adequate air space for cooling. Radios and antenna systems must be remoted as far away as possible in different directions.

Hardened Facilities

3-222. Military forces use many facilities in addition to fighting and protective positions. When a facility requires enhanced protection, it can be hardened to provide or improve cover to the structure and its occupants. Hardening helps to avoid or withstand hostile actions and is accomplished by using barriers, walls, shields, berms, or other types of physical protection.

3-223. Hardening of facilities also includes the use of bridge protective devices such as anti-mine booms, impact booms, and anti-swimmer nets. These devices typically protect bridges or crossing sites from waterborne demolition teams, floating mines, or floating debris. (See ATP 3-90.4/MCTP 3-34A (MCWP 3-17.8) discusses gap crossing.)

Camouflage and Concealment

3-224. Camouflage is materials and techniques used to hide, blend, disguise, or disrupt the appearance of military targets against their backgrounds to prevent visual and electronic detection by enemy forces. Camouflage and concealment can prevent an enemy from identifying friendly troops, equipment, activities, or installations. One of the fundamentals of camouflage in any environment is to fit into the existing ground pattern while disrupting the natural terrain and foliage as little as possible. When troops construct manmade positions, they camouflage with artificial cover to prevent detection. Units keep camouflage fresh; wilted or dead vegetation can give away positions.

3-225. Poor camouflage in one position can lead to tactical and operational failure as one poorly concealed vehicle can compromise the entire force. Improvisation with available materials is just as important as the proper employment of dedicated and specialized camouflage systems. The enemy can easily observe from long distances the shine from optical instruments (which should be kept shaded) and chemical agent resistant coating paint that has been polished by continual wear. Troops cover running gears on tracks that have been polished by wear with burlap when stationary. Units remove or lower windscreens and windows to prevent reflection of the sun and heat. They reduce vehicle silhouettes by covering vehicles with a wide-mesh net and using foliage brackets to attach local vegetation. Twine or wire may be used as an alternative to the mesh net, provided vegetation is available. Troops can obtain local materials to break up the distinctive outlines of military equipment that are easily observed from great distances in the jungle environment. (See TM 43-0139 for description of disruptive pattern painting for vehicles and aircraft.)

3-226. Sustainment assets rely on concealment for most of their protection. The following guidelines help unit commanders in concealing trains while stationary or on the move:

- When stationary, place camouflage canopies over vital assets, such as tankers, to disguise their critical function and reduce heat absorption.
- When travelling on soft soil or mud, have vehicles follow in the tracks of the preceding vehicle to complicate the enemy's ability to determine the number of vehicles in a convoy.
- When stationary, have vehicles avoid halting in a clearly distinguishable pattern; geometrically uniform patterns stand out in a natural environment.

3-227. The preferred camouflage net is the lightweight camouflage screen system, which provides concealment from visual, near IR, and radar sensor devices. Additionally, the transparent version of the lightweight camouflage screen system allows U.S. units to camouflage radars without limiting their effectiveness. Alternatives to the lightweight camouflage screen system, in order of effectiveness, include—

- The specially produced jungle-pattern net of the lightweight camouflage screen system.
- An open-weave cloth (appropriately colored) stitched to an ordinary wide-mesh net. This provides both color and texture and can be suitably garnished with radar-scattering plastic, such as that used in the lightweight screening system, and with any local vegetation.
- A color appropriate cover of close-weave cloth.
- A standard net garnished solid, threaded in long straight strips that have been colored to harmonize with the terrain. Troops need to maintain the garnishing.

3-228. The number of nets required depends on the size of the equipment to cover. A sufficient number of nets allows a sufficient gradual slope of not more than 15 degrees from the top of the equipment to the jungle floor. Troops prevent sharply sloping nets since they indicate manmade structures and may compromise the position.

3-229. When using nets for stationary equipment—

- Do not allow nets to touch sensitive items such as helicopter rotor heads and radio antennas which may cause a net to catch fire or damage the equipment.
- Do not pull nets so tight that each supporting pole stands out.
- Ensure the net does not prevent the equipment from fulfilling its primary task. Some equipment, such as helicopters, require camouflage be removed and secured to employ the equipment.
- Avoid straight-edged patterns on the ground, as these indicate a manmade structure.
- Use burlap spray-painted in a nondescript jungle color to cover reflective surfaces (excluding fire control optics).
- Cut jungle scrub in the immediate area.
- Use poles, natural or man-made, to raise the nets from the equipment and conceal its shape.

3-230. After providing local security, camouflage is typically the next priority at vehicle halts. Actions to be taken are:

- Site in vegetation or shadow, if available.
- Cover shiny surfaces and shadow areas with burlap screens.
- Drape camouflage netting.
- Add available vegetation to the net.
- Obscure or sweep away vehicle tracks for 165 feet (50 meters) behind vehicles.

3-231. Stationary aircraft take a relatively long time to conceal as they are fragile in comparison with other equipment, have a considerable heat signature, and must also be readily accessible for maintenance. The more they are concealed, the longer their response time is likely to be. Some aircraft may not be able to conduct operations while carrying their supporting camouflage equipment and require supporting assets. The following actions improve the concealment of an aviation tactical assembly area:

- Ensure aircraft approach the site from a terrain masking avenue to avoid enemy surveillance.
- Cover all reflective surfaces.
- Move aircraft into shadow if possible.

- Rotate the main rotor (depending on the type) until it is at a 45-degree angle with the fuselage and drape a net over the rotor and fuselage.
- Conceal the remainder of the aircraft.

Supply Points

3-232. It is especially important to conceal supply points dispersed throughout the jungle. During jungle operations, the enemy often designates supply points as high-value targets as their destruction (especially water, and fuel supplies) can effectively cripple the force. A *high-value target* is a target the enemy commander requires for the successful completion of the mission (JP 3-60). The high volume of traffic to supply points often damages the environment. The enemy can easily detected the damage, which compromises the location's security. To mitigate this, units strive to conceal supply points and other critical sites throughout the support area.

3-233. When selecting positions for supply points during jungle operations, concealment trumps convenience. This is especially important when air defense coverage is limited and friendly air superiority is contested or sporadic. When establishing supply points, units consider the following:

- Position supply points along existing roads and trails as the construction of new roads or trails can compromise the supply point.
- Position stocks in irregular spaces, both in length and depth, to the maximum extent possible so that there is no definite pattern.
- Pile stocks as low as possible and preferably dug in. For example, stack gasoline cans only one can high.
- Prepare the shape of the area not square or rectangular but following the local ground pattern.
- Conceal stocks with the lightweight camouflage screen system, burlap, or local vegetation.
- Mix the contents of each supply point so that the destruction of one supply point will not cause an immediate shortage of a particular commodity.

AIR AND MISSILE DEFENSE

3-234. Air and missile defense protects the force from missile attack, air attack, and aerial surveillance by ballistic missiles, cruise missiles, fixed- and rotary-wing aircraft, and UAS. It prevents enemies from interdicting friendly forces, while freeing commanders to synchronize movement and firepower. All members of the combined arms team perform air defense tasks; however, ground-based air defense artillery units execute most Army air and missile defense operations. Air and missile defense elements coordinate and synchronize defensive fires to protect installations and personnel from over-the-horizon strikes. Army air and missile defense capabilities increase airspace situational understanding and support the area air defense commander.

3-235. The air and missile defense assets integrate protective systems by using the six employment guidelines—mutual support, overlapping fires, balanced fires, weighted coverage, early engagement, and defense in depth—to mass and mix air and missile defense capabilities. These employment guidelines enable air defense artillery forces to successfully accomplish combat missions and support overall force objectives.

3-236. All units develop a scheme for countering air attacks that employs both active and passive measures. Passive air defense measures reduce a unit's vulnerability to, or minimize damage from, an air attack. Passive air defense measures include camouflage and concealment, positioning and dispersion, the construction of fighting and protective positions, hardening of positions and facilities, and recovery and reconstitution plans. Active air defense measures are the direct actions taken to destroy enemy aerial platforms or reduce their effectiveness. (See ATP 3-01.8 for additional information on air defense techniques.)

3-237. Staffs carefully plan to ensure that dispersion of forces does not create gaps in air defense coverage. Extended LOCs and the dispersed nature of jungle operations increases the requirements for dedicated air and missile defense units. To mitigate gaps in coverage, commanders may require highly mobile short-range air defense units to support maneuver units. These air defense assets must be as mobile as the force they are tasked with supporting. Less mobile, intermediate-range air defense units and radar assets are positioned in areas where restrictive jungle terrain will not interfere with their operation. Tactical-level active and passive

air defense measures can be effective but are not a substitute for the capabilities provided by dedicated air defense units against peer threats.

POLICE OPERATIONS

3-238. Military police support jungle operations by conducting police operations and detention operations, and by providing security and mobility support. Military police trained and have equipment to support mobility operations such as breaches, gap-crossings, and passage of lines; conduct MSR or ASR regulation and enforcement; and develop and manage a traffic control plan. Military police are also critical enablers for area security operations such as securing bases/base camps; securing LOCs, supply points, and convoys; conducting response force operations; and executing port and pier security. Commanders prefer employing military police for detainee operations and for providing support to populace and resource control operations, such as dislocated civilian operations and noncombatant evacuation operations.

CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR OPERATIONS

3-239. *Chemical, biological, radiological, and nuclear operations* include the employment of capabilities that assess, protect against, and mitigate the entire range of chemical, biological, radiological, and nuclear incidents to enable freedom of action (FM 3-11). CBRN threats and hazards include weapons of mass destruction, improvised weapons and devices, and toxic industrial chemicals (known as TICs). CBRN weapons have the potential to cause mass casualties and significantly disrupt operations by complicating standard tasks. During large-scale combat operations, most enemies likely have significant CBRN capabilities and the doctrine to employ them during conventional operations.

3-240. Jungle areas require exceptionally high standards of discipline and conditioning to maintain an effective CBRN defense readiness. These higher standards result from the jungle's high temperature, humidity, and heavy rainfall, which compound the effects of operating in CBRN protective equipment. Wind, which helps disperse persistent chemical agents, is often reduced by the jungle's dense vegetation. (For more information on CBRN operations, refer to FM 3-11 and ATP 3-11.36/MCRP 10-10E.1/NTTP 3-11.34/AFTTP 3-2.70.)

Weather Effects on CBRN Operations and Obscurants

3-241. The effectiveness of CBRN weapons and obscurants is directly proportional to air stability. Air stability results from temperature variations at different altitudes. Temperature fluctuations between day and night directly affect air stability. At night and in early morning the jungle air is very stable. CBRN agents and obscurants employed under stable conditions are the most persistent and offer better area coverage than agents and obscurants employed in unstable air conditions. Jungle air is very unstable during the late morning through afternoon. CBRN agents and obscurants employed in the late morning and afternoon often dissipate more quickly. This may lead to ineffective target area coverage. Three types of temperature differences influence CBRN and obscurant operations:

- Unstable (lapse). Unstable conditions exist when air temperature decreases with altitude. In the jungle, this mostly occurs between late morning and early evening.
- Neutral. Neutral conditions exist when air temperature does not change with altitude. In the jungle, this mostly occurs during early morning and early evening.
- Stable (inversion). Stable (inversion) weather conditions exist when the air temperature increases with altitude. In the jungle, this mostly occurs between late evening and early morning.

3-242. Wind patterns in the jungle are seasonally steady and predictable. Wind has the greatest effect on the dispersal of biological, chemical, obscurant, and radioactive clouds. Generally, the optimal wind speed for effective dispersal of biological, chemical, obscurant, and radioactive clouds is between five and ten knots. Below five knots and the clouds remain stagnant and do not spread optimally. Above ten knots and the clouds tend to disintegrate, thereby reducing effectiveness and potentially spreading the cloud in an unpredicted manner.

Water Requirements

3-243. Water requirements for decontamination and consumption increase dramatically in a CBRN environment. CBRN protective equipment increases perspiration and requires increased water consumption to mitigate liquid lost through sweat. Replacement of fluids lost through sweat is a critical use of water and generally comes ahead of all other uses.

Chemical Weapons in the Jungle

3-244. Chemical weapons are prohibited under the Chemical Weapons Convention; however, several peer threats possess chemical weapons and see their use as a means for achieving operational overmatch against U.S. forces. Threat doctrine describes the employment of chemical weapons in constrictive, canalizing terrain, such as the jungle, as a way to deny key terrain, isolate friendly forces, and induce battlefield complexity. Chemical hazards and concerns have expanded greatly since the Chemical Weapons Convention was signed and include a large number of toxic industrial chemicals. Chemical hazards are any chemicals (manufactured, used, transported, or stored) that can cause death or other harm through the toxic properties of those materials.

3-245. Commanders consider how using chemical agents affects offensive and defensive jungle operations. Units can use chemical agents to create casualties, degrade performance, slow maneuver, deny terrain, and disrupt logistical support. Engineers can mix high explosives with the chemical attack to conceal the use of chemicals and complement their effects. Units typically use persistent chemical agents to create contaminated obstacles to maneuver around and non-persistent agents to cause casualties.

3-246. The jungle environment considerably affects the use and effectiveness of chemical weapons and hazards. High daytime temperatures of the jungle increase the incapacitating effects of liquid agents because they vaporize quickly. Routinely low jungle winds cause vapors under the canopy to hang in the air and remain hazardous for long periods, but heavy vegetation causes chemical clouds to drift downwind in irregular patterns and concentrations. Chemical agents dispersed over still bodies of water, such as lakes and ponds, can become more persistent and present a prolonged hazard. Sprayed agents work less effectively in the jungle as the thick canopy prevents the droplets from reaching the jungle floor.

3-247. Support areas and logistical hubs are lucrative targets for chemical attacks. Contaminating logistical supplies and equipment can significantly disrupt tactical and operational effects by degrading mobility, increasing transit times, and destroying critical Class I stocks of food and water.

Biological Weapons in the Jungle

3-248. The United States is a signatory to the Biological and Toxin Weapons Convention (also known as Biological Weapons Convention) and renounces the development and use of biological weapons; however, many potential threats continue to maintain or develop biological weapons.

3-249. A *biological agent* is a microorganism (or a toxin derived from it) that causes disease in personnel, plants, or animals or causes the deterioration of materiel (JP 3-11). Biological agents are classified as either pathogens or toxins. Pathogens are disease-producing microorganisms (bacteria, viruses, and fungi) that directly attack human, plant, or animal tissue and biological processes. Toxins are poisonous substances naturally produced by bacteria, plants, fungi, snakes, insects, and other living organisms and may be produced synthetically.

3-250. Depending upon the agent's incubation period, biological weapons can produce lethal effects in anywhere from 1-24 days from the time of exposure. Because they are live agents, biological weapons are more difficult to employ via conventional bombs, artillery, and explosives as the high heat generated by the blast has the potential to render the biological agent ineffective. Live biological agents are often dispersed by non-conventional methods, such as spraying, deliberate contamination and sabotage, and human agents. The most effective wind speeds for dispersing biological agents are from 8–18 knots. Stable jungle air conditions (night or early morning) provide optimal conditions for agent concentration and area coverage. Unstable jungle air conditions (late morning and afternoon) promote atmospheric mixing and lower agent concentration, thereby reducing effective target coverage.

3-251. Force health protection measures provide optimal protection against biological weapons. Troops regularly secure and test food and water sources to prevent and detect contamination. Units enforce field sanitation and personal hygiene measures to mitigate the impact of both naturally occurring diseases and biological weapons. Commanders ensure that all Soldiers/Marines are current on both standard vaccinations and regional or environment specific immunizations.

3-252. Toxins do not require an incubation period, can cause effects immediately upon contact, and are more stable than live biological agents. They can be disseminated as a liquid, vapor, or powder, and delivered by aerosol generators, artillery, rockets, or bombs. Because of their immediate effects, toxins are easier to detect than other biological agents.

3-253. The jungle environment is conducive to the use of biological agents. Biological agents often tolerate high humidity and warm temperatures well and can persist in areas with limited wind flow. As with chemical agents, downwind spray hazards are reduced by the lack of wind in the jungle.

Nuclear Weapons in the Jungle

3-254. Many potential adversaries maintain nuclear weapons while additional state and non-state actors strive to obtain them. Nuclear weapons can be delivered by missiles or bombs and can be exploded in the air, on the ground, or below the ground. Depending upon the radiation dosage received, effects can be felt immediately or delayed for days.

3-255. Nuclear weapons have a major bearing on tactics because of their ability to make areas impassable or uninhabitable through radioactive contamination. This makes them ideal for denying key terrain, blocking maneuver corridors, and isolating friendly forces. The enemy can employ nuclear weapons in the jungle, which naturally constricts maneuver and compartmentalizes forces, to further complicate mobility. Nuclear weapons can destroy large concentrations of troops and equipment, or make critical infrastructure, such as ports, completely unusable. They may also be used to destroy or block reinforcing formations and isolate forward positioned forces. Because of their immense destructive power, nuclear weapons can facilitate the defeat of a large force by a relatively smaller, or less sophisticated enemy.

3-256. The initial effects of nuclear blasts are not significantly reduced by jungle foliage but may be mitigated by the sharp changes in relief found in mountainous jungle areas. The dense jungle canopy may provide some protection against thermal radiation and fallout; however, trees closer to the blast will become sources of shrapnel and flying debris. The lack of high winds and still pockets of air found in jungle valleys may contain radioactive fallout in certain areas. Radioactive debris and fallout may rest on the thick jungle canopy; however, subsequent rain will wash these particles to the ground and concentrate them in low-lying areas. These areas have the potential to contain high levels of radiation.

3-257. Detonated nuclear weapons release energy that affects troops and equipment in three forms: blast, nuclear radiation, and thermal radiation (heat and light).

Blast

3-258. Nuclear weapons are often detonated as air burst weapons to enhance the weapon's destructive effects. Nuclear blasts raise considerable amounts of contaminated debris that inhibit observation and may prevent maneuver long after the blast has subsided. The radius of damage is normally smaller in jungle terrain as mountains and valleys compartmentalize the effects. Soldiers/Marines occupying improved fighting positions, fighting vehicles, and protected structures can withstand nuclear blasts better than Soldiers/Marines in exposed areas.

Nuclear Radiation

3-259. Immediate nuclear radiation is a function of weapon yield. When detonated at low altitude or ground level, residual radiation is high in the immediate area. The amount of residual radiation is also affected by the time of day and the wind. In the late afternoon, residual radiation may drift in an irregular pattern and direction due to jungle air instability. Constant radiation monitoring and reconnaissance are vital to protect troops, especially from contaminated water runoff.

Thermal Radiation

3-260. Terrain masking and dense vegetation in the jungle reduces the effective range of thermal radiation (heat and light). The danger of blinding or burning troops with a nuclear detonation decreases in a jungle.

Battlefield Obscuration

3-261. *Obscuration* is the employment of materials into the environment that degrade optical and/or electro-optical capabilities within select portions of the electromagnetic spectrum in order to deny acquisition by or deceive an enemy or adversary (ATP 3-11.50). *Obscuration* is the effects of weather, battlefield dust, and debris, or the use of smoke munitions to hamper observation and target-acquisition capability or to conceal activities or movement (MCRP 1-10.2). Units use obscurants to protect friendly forces during tactical operations. Units also may employ obscurants to support tactical deception operations, mark targets for lethal fires, mark friendly locations, and potentially support EW operations. Obscuration is a critical component of enabling operations like breaches and gap-crossings. Obscurants dispersed on enemy forces at night interfere with the effective functioning of NVD and IR optics.

3-262. Obscurants can be very effective in humid jungles with dense vegetation and low winds. Obscurants work best when wind conditions are under five knots, air is stable, humidity is high, mist or fog is present, and cloud cover is overcast with a low ceiling. Obscurants can absorb moisture from the air and become much more persistent and effective in humid environments. In jungles, obscuration has a tendency to be more evenly dispersed and to persist longer than over more open terrain. Low wind speeds under the canopies spread obscurants slowly in a downwind and downslope direction. Obscurant clouds tend to follow gullies and streambeds. Upslope winds can halt or divert this flow.

3-263. The effectiveness of platform-based obscuration, such as light vehicle obscuration smoke system, is limited in jungles due to reduced mobility and the inability for obscurants to be deployed as a curtain or screen. Jungles with thick canopies reduce the effectiveness of artillery- and mortar-delivered obscuration. Thick canopies impact the trajectory of munitions and reduce lines of sight, thereby limiting the ability for Soldiers/Marines to use obscurants to mark targets or identify friendly positions and locations. However, units can employ artillery- and mortar-delivered obscurants to provide effective protection obscuration for troops operating in the jungle.

Note. Despite the use of obscuration to protect friendly forces or deceive the enemy, platform-based or individual obscuration inherently reveals the presence of friendly forces and can compromise the element of surprise.

Mission-Oriented Protective Posture

3-264. The threat of CBRN weapons use requires commanders to consider the mission-oriented protective posture (MOPP) of their forces. MOPP includes the use of protective masks and clothing as well as vehicle configurations and operations, which can impact the effectiveness and performance of troops. The higher the MOPP level, the higher the impact on Soldiers/Marines.

3-265. According to METT-TC/METT-T, the commander decides which MOPP level to assume. Heat, fatigue, and stress all increase as MOPP levels increase and can affect the performance of Soldiers/Marines. This is especially true with high jungle temperatures and humidity. Well-trained and acclimated Soldiers/Marines tolerate wearing protective gear better than those who are not as well trained or acclimated. Troops in protective gear fire weapons less accurately, move more slowly, and must rest more often. Jungle heat, fatigue, and stress caused by wearing CBRN protective equipment slows movement and makes tasks take longer to complete. Changing the MOPP level during operations requires Soldiers/Marines to stop their actions and adjust their equipment appropriately.

3-266. The stress from strenuous activity while wearing protective gear is compounded by heat and humidity. If possible, troops complete hard work at night or during the coolest part of the day. In the jungle, leaders can expect heat injuries to occur to Soldiers/Marines dressed in MOPP level 4 within 30 minutes while they perform heavy work in 90-degree Fahrenheit (32 Celsius) temperatures. Leaders need to provide work/rest periods to reduce the chances of heat injuries. When Soldiers/Marines wear protective clothing,

staffs add at least 10 degrees Fahrenheit (5.5 Celsius) to the WGBT index for light work and 20 degrees Fahrenheit (11 Celsius) for moderate to hard work. Because of higher body temperatures, troops in MOPP equipment perspire more than usual and have increased water requirements. See Table 1-1 on page 1-13 for work/rest cycles and water consumption guidelines.

Decontamination

3-267. *Decontamination* is the process of making any person, object, or area safe by destroying, neutralizing, making harmless, or absorbing and removing chemical or biological agents or by removing radioactive material clinging to or around it (JP 3-11). Decontamination operations in the jungle have complicated challenges associated with transporting the required chemicals and equipment over complex terrain lacking developed infrastructure. Although decontamination should occur as far forward as possible, moving the required equipment and supplies may challenge the logistical system.

3-268. When the logistical situation prevents the transportation of necessary equipment and chemicals to the point of need, troops can use jungle soil, mud, and local water sources to conduct immediate decontamination operations. When decontaminating vehicles and equipment in this manner, Soldiers/Marines apply soil or mud on the exterior of the equipment and then remove it by brushing or sweeping. Then they rinse equipment with running water. The soil's ability to absorb contaminating agents depends on its moisture content, so heavily saturated soils may not be suitable for decontamination operations. Troops need to follow brackish or saltwater decontamination with a fresh water rinse to minimize corrosion. Engineers conduct a chemical agent detection to ensure the decontamination adequately removed the agent. (For more information on CBRN passive defense, refer to ATP 3-11.32/MCWP 10-10E.8/ NTTP 3-11.37/AFTTP 3-2.46.)

Survivability and the Electromagnetic Spectrum

3-269. Detection risks destruction in the jungle, so units are increasingly vulnerable to detection by their electromagnetic signature. Significant advances in command, control, and communications technology have greatly increased the electromagnetic signature of Army/Marine forces. Similarly, the explosive growth of affordable UAS and increasingly sophisticated sensors have increased the enemy's ability to detect friendly forces both visually and through their electromagnetic signature. To ensure survivability, commanders reduce or mask the visual and electromagnetic signature of their forces. Army/Marine Corps forces train to proficiently use active and passive protection measures—such as camouflage, light discipline, rapid repositioning, and survivability positions—to reduce or mitigate effects of their electromagnetic signature.

3-270. Headquarters and command posts often produce extremely large electromagnetic signatures and are considered high-value targets to enemy forces. To ensure survivability, commanders take special care to reduce or mask the visual and electromagnetic signature of their headquarters. Measures to reduce or mitigate the electromagnetic signature of headquarters and command posts include dispersing command posts, creating survivability positions, using fiber-optic cable and wire-based communications, camouflaging critical sites, masking antennas with terrain, and remotely locating the headquarters' associated antennas and satellite dishes.

Security of Supply Routes

3-271. The relative scarcity of all-weather and improved roads in the jungle may increase the length and difficulty of securing ground supply routes. Enemy ambushes and mines constantly threaten ground supply routes where few alternative routes are available and convoy operations are often predictable.

3-272. Supply convoys must develop and implement TTP to mitigate ambushes, air, and artillery attacks. Convoys maintain intervals between vehicles to limit the effectiveness of enemy attacks. However, the dense vegetation and limited visibility of the jungle often require closer intervals between vehicles than convoys operating in open or unrestricted terrain. Effective intervals are small enough to facilitate mutual support but large enough to negate the effectiveness of the enemy's largest casualty producing weapon. During halts convoys assume formations to better defend against enemy attack. The herringbone formation works as an effective defensive posture during temporary halts in certain terrain. Ultimately, units may require security forces, such as military police, to protect convoys and secure critical LOCs.

3-273. Route signing enhances security by aiding navigation and preventing convoys from becoming lost or leaving the MSR or ASR. Along with using clear naming conventions, troops clearly mark MSRs and ASRs for all visibility conditions. Military police are trained and equipped to conduct route signing and can also position themselves along the MSR at critical junctures, intersections, or holding areas to help guide traffic.

3-274. Combat engineers or route clearance companies are trained and equipped to identify and reduce explosive hazards and obstacles along routes. Engineers clear or reduce obstacles; repair blast holes, craters, damaged culverts, bridges, and ford sites; and remove vegetation from the route's shoulders. Horizontal engineers may be required to construct and maintain MSRs and ASRs throughout the AO.

3-275. Military police has specialized training and equipment to conduct convoy security and route security operations. They patrol and clear routes and areas as needed according to priority of efforts, resources, and time available.

3-276. Although labor and resource intensive, clearing vegetation from the route's shoulders can help prevent ambushes by denying the enemy the requisite concealment. Clearing vegetation also makes it more difficult for the enemy to emplace mines or improvised explosive devices (IEDs) while simultaneously facilitating friendly aerial observation and airmobile operations along the road.

3-277. Manned and unmanned aircraft increase the security of supply routes by conducting aerial reconnaissance and surveillance missions either in dedicated support or while transiting the AO. Electronic sensors on the ground and in the air, including coherent change detection, can detect enemy movement along the route.

3-278. Bridges are vulnerable points in any supply route and should be protected. Units may need a static security post to secure the bridge against attack by guerrillas or infiltrators. Such posts in remote areas will be larger than those closer to supporting forces. The higher headquarters develops plans and allocates forces to support security posts and checkpoints in the event of enemy attack. The tactical combat force may be designated as the response force for enemy attacks on security posts and checkpoints. The *tactical combat force* is a rapidly deployable, air-ground, mobile combat unit with appropriate combat support and combat service support assets assigned to, and capable of, defeating Level III threats, including combined arms (JP 3-10).

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Chapter 4
Jungle Offensive Operations

This chapter outlines the purpose and characteristics of jungle offensive operations. It reviews the various offensive operations, forms of maneuver, and the impact the environment has on these actions.

OFFENSIVE OPERATIONS

4-1. Offensive actions are combat operations conducted to defeat and destroy enemy forces and seize terrain, resources, and population centers. They impose the commander's will on the enemy. A commander may also conduct offensive actions to deprive the enemy of resources, seize decisive terrain, deceive or divert the enemy, develop intelligence, fix an enemy in position, or disrupt an enemy attack. Units can destroy the enemy by concentrating friendly forces at a weak point in the enemy's defense and destroying enemy combat units, or by driving deep into the enemy's rear to destroy their sustainment elements and cut the enemy's LOCs.

4-2. Offensive operations in the jungle orient on the enemy, not the terrain. Wherever units find the enemy, they destroy or defeat it in that location. If units allow the enemy to escape, they will have to find the enemy again, which requires additional resources, personnel, and risk. During jungle operations, attacking forces conduct movement to contacts, hasty or deliberate attacks, exploitations, and pursuits. Within a division, lead elements of forward units conduct deliberate attacks on the enemy's weak point or flank to open a gap for follow-and-assume forces to exploit success. Lead units of the exploiting force conduct movement to contact and hasty attacks to overcome pockets of enemy resistance.

4-3. Effective offensive operations require mobility; however, the jungle is not conducive to mobility. Commanders seek the capability to move, exploit, and pursue an enemy across a wide front. When attacking, commanders concentrate the effects of combat power at selected locations. This may require a unit to improve or construct combat trails through areas where routes do not exist. The surprise achieved by attacking through an area believed to be impassable may justify the effort expended in constructing these trails. Whenever possible, forces bypass existing obstacles and minefields instead of breaching them. Jungle environments do not support vehicle mobility. Mounted forces conducting offensive operations require extensive engineer resources to achieve limited levels of mobility to support movement and maneuver/maneuver.

4-4. Several factors require special consideration when conducting offensive operations in the jungle. Thick foliage challenges leaders' ability to control the movement of Soldiers/Marines while also making it more difficult to detect the enemy. Consequently, tactical movement formations are often closer than in open, unrestricted terrain. Thick foliage and mountainous terrain make it more difficult to observe and adjust indirect fire. Finally, the heat, humidity, and lack of LOCs hinder the momentum or speed characteristic of most successful offensive operations.

4-5. Enabling operations are key to successful offensive operations. An attacking force conducts aggressive reconnaissance to gain and maintain the initiative by identifying enemy obstacles, units, weak points, and flanks, while simultaneously detecting threats to their flanks and sustainment elements. A moving force has a disadvantage in the jungle due to limited observation ranges and the higher chance of meeting engagements dictated by a stationary force in prepared positions. Therefore, leaders must push reconnaissance units as far out from the main body as possible to allow early warning and to deny the enemy the element of surprise.

4-6. During offensive operations, commanders recognize that some offensive fundamentals acquire a new significance in the jungle. Because gathering accurate and timely information is challenging, aggressive reconnaissance is critical during offensive operations in the jungle. A unit attacking without timely information on the location of the enemy may subject its subordinate units to enemy ambush without being

able to support them. In such a situation, the enemy may defeat the subordinate units in detail. Commanders will most often employ the reconnaissance pull technique in jungle offensive operations to gain answers to their commander's critical information requirements. Reconnaissance pull determines routes suitable for maneuver, the enemy's strengths and weaknesses, and existing gaps, thus pulling the main body toward and along the path of least resistance. (For more detailed information on reconnaissance techniques, refer to FM 3-98.)

4-7. Using weapons to their fullest potential is key to effective jungle operations. Primary jungle weapons include infantry small arms, supported by medium and light machine guns and 60mm mortars. In addition to organic weapons, the ground commander must closely coordinate the employment of available supporting weapons. Dense foliage found in some jungles may prevent heavy weapons from moving directly with the infantry. Tube launched, optically tracked, wire guided missiles and Javelins are of limited use in most jungle environments. Troops that use these weapons may be more effective as security forces or as reinforcements for maneuver elements.

4-8. Given the challenges to mobility and the dispersed nature of jungle operations, commanders and staff pay close attention to the ability for units to support each other during offensive jungle operations. When developing the concept of operations and scheme of maneuver, commanders and staff use supporting range and supporting distance to determine a feasible concept for mutual support. *Mutual support* is that support which units render each other against an enemy because of their assigned tasks, their position relative to each other and to the enemy, and their inherent capabilities (JP 3-31). In Army doctrine, mutual support is a planning consideration related to force disposition, not a command relationship. Mutual support has two aspects: supporting range and supporting distance. *Supporting range* is the distance one unit may be geographically separated from a second unit yet remain within the maximum range of the second unit's weapons systems (ADP 3-0). *Supporting range* is the distance one unit may be geographically separated from a second unit yet remain within the maximum range of the second unit's weapons systems (MCRP 1-10.2). *Supporting distance* is the distance between two units that can be traveled in time for one to come to the aid of the other and prevent its defeat by an enemy or ensure it regains control of a civil situation (ADP 3-0). The Marine Corps defines *supporting distance* as the distance between two units that can be traveled in time for one to come to the aid of the other (MCRP 1-10.2). Due to the complexity of the terrain and cover provided by vegetation in the jungle, mutual support does not mean that any one unit is always in position to fire against an enemy threatening another unit. Units must be capable of maneuvering in support of one another without disrupting the scheme of maneuver.

4-9. Adjacent units must be able to support an engaged element quickly. The commander must consider METT-TC/METT-T in determining geographical separation between subordinate units. Staffs can express the separation in either time or distance to provide mutual support. Scouts and connecting patrols should cover gaps between units.

4-10. Additional considerations for jungle offensive operations are—

- The fragmentation of tree branches and overhead cover enhance lethal effects of artillery and mortar fire.
- Because of challenges to navigation and the reduced visibility between elements, jungle offensive operations should use phases with intermediate objectives at short ranges to ensure cohesion.
- Commanders build flexibility into their offensive operation plans. Plans have enough flexibility to shift the main effort quickly during the operation once troops locate the enemy and the defensive disposition is made clear.
- Troops maintain the tempo of offensive operations by planning for follow-and-support or follow-and-assume forces.
- Troops increase security measures at all levels to eliminate surprise and reduce the risk of ambush.
- Commanders designate small reserves just behind the forward units to provide flexibility and enable rapid reaction once troops locate the enemy.

CHARACTERISTICS OF THE OFFENSE

4-11. Characteristics of the offense include audacity, concentration, surprise, and tempo. Effective offensive operations capitalize on accurate and timely intelligence and other relevant information regarding enemy

forces, weather, and terrain. Commanders maneuver forces to positions of relative advantage before contact. Contact with enemy forces before the decisive operation is deliberate and designed to shape conditions for the decisive operation. The decisive operation determines the outcome of the major operation, battle, or engagement and capitalizes on subordinate initiative and shared understanding.

4-12. While successful offensive operations in the jungle employ all the characteristics of the offense, they are normally characterized by a combination of dispersion and concentration. For example, a rifle company may move out in a dispersed formation so that it can locate the enemy without being observed. Once a platoon initiates contact, the dispersed platoons close on the enemy rapidly from all directions to concentrate their combat power and overwhelm the enemy.

AUDACITY

4-13. Audacity is a willingness to take bold risks. Commanders demonstrate audacity by balancing risk decisions with potential gains as they execute their plans. In a jungle attack, a commander can capitalize on audacity through careful terrain analysis when designing the concept of operations and scheme of maneuver. Given the nonlinear nature of jungle operations, careful terrain analysis can reveal unique directions of attack that may surprise the enemy. Audacity can also be embodied in an operation by inventively integrating and coordinating the direct action tasks of SOF throughout the operation. Combining SOF actions with conventional attacks can unhinge an enemy defensive plan. Finally, commanders incorporate audacity by adjusting operations in time; actions that may typically be sequential are conducted simultaneously to present the enemy with multiple dilemmas.

CONCENTRATION

4-14. Concentration is massing the effects of combat power in time and space at the decisive point to achieve a single purpose. Concentrating forces during jungle operations is difficult given the mobility challenges associated with the terrain and limited LOCs. Commanders carefully assess the ability for dispersed forces to provide mutual support based on the supporting range and supporting distance of subordinate units. During offensive operations, commanders achieve concentration by planning operations along converging axes. Commanders can also achieve concentrating forces in the jungle by maintaining a large, airmobile reserve to rapidly concentrate forces once the enemy is located. Units must maintain the ability to rapidly disperse after they have concentrated to avoid presenting the enemy with a lucrative target.

SURPRISE

4-15. Commanders surprise enemy forces by attacking at a time, place, or in a manner that the enemy does not expect. Audacity and surprise are complementary; audacious plans often rely on surprise to achieve initiative and an advantage over the enemy. Attacking at night, or from unexpected or multiple axes, can achieve tactical surprise. Operational surprise requires careful OPSEC and deception operations to conceal the objective and timing of friendly operations.

TEMPO

4-16. *Tempo* is the relative speed and rhythm of military operations over time with respect to the enemy (ADP 3-0 and MCRP 1-10.2). A high operational tempo gains and retains the initiative by forcing the enemy to react to friendly operations. Commanders conducting jungle operations maintain a higher operational tempo than the enemy by rotating forces to facilitate adequate rest and resupply. Tempo is also determined by the capacity for sustainment/logistics, and commanders develop a concept of sustainment/logistics that is both flexible and anticipatory. The sustainment/logistics plan anticipates rates of consumption and is tailored to provide supplies to dispersed units as far forward as possible. The concept of sustainment/logistics facilitates the endurance and reach necessary to maintain operational tempo over the enemy.

4-17. Tempo is best achieved by designing offensive operations and campaigns that maintain constant pressure on enemy forces. During jungle operations, commanders exploit the success of movements to contact, ambushes, and raids by quickly following up with deliberate attacks and pursuits to prevent the enemy from reconstituting. Operations and campaigns that allow the enemy prolonged periods to rest,

resupply, and refit put friendly forces at additional risk and cede the momentum gained from the preceding operational successes.

TYPES OF OFFENSIVE OPERATIONS

4-18. Offensive operations consist of the movement to contact, attack, exploitation, and pursuit. In the jungle, the movement to contact and subordinate forms of the attack, such as the raid and the ambush, are the most effective offensive operations.

MOVEMENT TO CONTACT

4-19. A *movement to contact* is a type of offensive operation designed to develop the situation and establish or regain contact (ADP 3-90). Given the challenges with locating the enemy, the movement to contact is a common offensive operation conducted in the jungle. To be successful, movements to contact are followed by hasty attacks to capitalize on the surprise and confusion prevalent in the jungle. The execution of a movement to contact in the jungle differs little from the manner by which units execute it in other environments; however, dense foliage and restrictive terrain can influence whether units use single or multiple columns during movement.

4-20. For companies and battalions, multiple columns provide more control and are easier to deploy troops online than a single file. To speed up deployment, units develop and rehearse SOPs and immediate action drills. During a movement to contact in the jungle, troops maintain a distance of five to seven paces between each other while still maintaining visual contact through the thick vegetation.

4-21. Once units make contact with the enemy, the first establish fire superiority and suppress the enemy. The commander assesses the situation and deploys the unit to overrun the enemy forces while they are suppressed. In this way, the unit seizes the initiative. There should be no delay in the troops' movement from the march formation into assault formation. Security elements protect the rear and prevent the enemy's counterattack. Commanders may use a security force later to exploit a success, but they avoid committing the force until they understand the situation.

4-22. The slower pace of jungle maneuver requires a rapid call for supporting indirect fires. Upon making contact, unit immediately request fires on the enemy and adjust from planned targets. Effective and timely fire support requires accurate and continuous land navigation. Supporting fires and CAS can place fires on suspected enemy withdrawal routes, placing further pressure on the enemy.

4-23. Units assault the enemy once their exact position is identified and a hasty plan is developed. Soldiers remain alert for hidden enemy positions, snipers, and tunnels through which the enemy might move to attack from the rear. If assets and time permit, the commander may move a platoon or other force by air to conduct an air assault to an objective in the enemy's rear, thereby denying the enemy the ability to withdraw and preventing the enemy from conducting an effective counterattack.

4-24. Fortified enemy positions in dense jungle are often so well concealed that troops do not know of their presence until they have physically encountered them. When encountered during a movement to contact, the best COA is usually to adjust forward dispositions enough to allow use of supporting indirect fires, to deploy additional forces to block possible withdrawal routes, and then to maneuver under the cover of supporting fires to defeat the fortifications.

4-25. After troops seize the objective, the commander establishes security with a hasty perimeter, observation posts, and early warning devices and sensors. Security is critical as the enemy may attempt to counterattack while friendly forces conduct actions on the objective.

ATTACK

4-26. An *attack* is a type of offensive operation that destroys or defeats enemy forces, seizes and secures terrain, or both (ADP 3-90). *Attack* is an offensive action characterized by coordinated movement, supported by fire, conducted to defeat, destroy, or capture the enemy or seize and/or secure key terrain (MCRP 1-10.2). An attack differs from a movement to contact because in an attack, commanders know at least part of the enemy's disposition. When attacking in the jungle, the terrain often requires reduced distances between

troops and units, and the designation of assault positions as far forward as possible. An assault position is a covered and concealed position short of the objective from which units make final preparations to assault the objective. Because of the dense terrain and thick vegetation, many of the control measures and techniques used during limited visibility attacks work well during a jungle attack.

4-27. Because the enemy's disposition is known during an attack, commanders integrate indirect fire support into their scheme of maneuver. During the assault, supporting fires are placed on the enemy until shifted by the assaulting commander. They are then adjusted onto targets which will assist the progress of attacking forces by blocking enemy counterattacks or withdrawal.

4-28. Assaulting troops move over the objective using aggressive fire and movement to overcome enemy resistance. Assaulting troops must remain alert to snipers, mines, IEDs, and tunnels that permit the enemy to maneuver to the rear of attacking forces. Assaulting platoons and squads move in a single direction, with fires concentrated on enemy positions as they are located. Leaders adjust their progress and control movement through predetermined control measures, such as phase lines and visual signals. Troops can use obscurants to conceal the assault force's flanks from enemy observation and reduce their ability to deliver effective fires.

4-29. Fortified defensive positions are common in the jungle. If troops must attack such a position, they will likely encounter bunkers and obstacles such as wire, mines, IEDs, and booby traps. Units often have to blast or burn the enemy out of such positions. Attacking fortified defensive positions generally require attacks on a narrow front coupled with significant fire support. Engineers, special weapons, and equipment attached to the maneuver forces assist in destroying the fortifications.

4-30. As with movement to contact, after units seize the objective, the commander establishes security with a hasty perimeter, observation posts, and early warning devices and sensors. Security is critical as the enemy may attempt to counterattack while friendly forces are conducting actions on the objective.

4-31. A defending enemy possessing artillery, rocket, and cyberspace and electromagnetic activity capabilities seeks to use any advantage to disrupt friendly command or control, fire support, information collection, and sustainment activities. An attacking force considers the following when faced with a defending enemy enjoying superior fire support capabilities:

- To increase the range and effectiveness of friendly indirect fire systems, commanders target select enemy forces to enable the forward displacement and positioning of artillery assets.
- Disperse attacking troops, systems, and supplies as much as is possible.
- Protect attacking troops, systems, and supplies by moving them into attack positions only at the last possible moment.
- Counter enemy target acquisition efforts by using military deception, cover, and concealment effectively.
- Target enemy command and control nodes.
- Exploit initial penetrations of enemy defensive positions to the maximum extent possible. Overrunning enemy artillery systems, command and control nodes, and sustainment assets will seriously degrade a defending force's combat power.

Raids

4-32. A *raid* is an operation to temporarily seize an area to secure information, confuse an enemy, capture personnel or equipment, or to destroy a capability culminating with a planned withdrawal (JP 3-0). Marine Corps amplification is an attack, usually small scale, involving a penetration of hostile territory for a specific purpose other than seizing and holding terrain. It ends with a planned withdrawal upon completion of the assigned mission (MCRP 1-10.2). Raids are usually conducted by battalion-sized or smaller forces. Raids are audacious, rapidly executed, and of short duration.

4-33. Jungles favor raid operations as the excellent concealment enables skilled raiding patrols to operate deep in enemy territory. Platoon-sized units are best suited to jungle raids. Commanders plan for supporting artillery fires, but due to the raid's reliance on stealth and surprise, may execute plan without indirect fire support.

4-34. Raids that require deep penetration into enemy-held areas are best executed by establishing a patrol base in the general area of the final objective. From there, leaders can send reconnaissance patrols to reconnoiter enemy positions while the rest of the force completes its preparations for the raid. Helicopters and watercraft can effectively transport a raiding force rapidly to the vicinity of its objective without depleting its physical strength in a difficult march.

4-35. Raids in the jungle environment must stem from reliable and precise intelligence. The actions of the raiding unit must be decisive and rapid to catch an elusive jungle enemy. A raid's success depends on good intelligence, a sound plan, and a rehearsed withdrawal.

4-36. Logistic support is normally minimal when units conduct raids. Units should carry as much petroleum, oils, lubricants, and ammunition as possible and take advantage of any captured enemy supplies. (See also paragraph 3-188 for more on captured supplies.) Once a raiding force crosses its line of departure, only limited, emergency aerial resupply of critical supplies and aeromedical evacuation are feasible given the absence of secure ground LOCs. Commanders must thoroughly plan for aerial resupply of a raiding force, since it entails greater risk than normal operations. Under these conditions, units typically destroy damaged equipment that cannot maintain the pace of operations.

Ambush

4-37. An *ambush* is an attack by fire or other destructive means from concealed positions on a moving or temporarily halted enemy (FM 3-90-1). *Ambush* is a surprise attack by fire from concealed positions on a moving or temporarily halted enemy (MCRP 1-10.2). An ambush stops, denies, or destroys enemy forces by maximizing the element of surprise. Ambushes can employ direct fire systems as well as other destructive means, such as command-detonated mines, indirect fires, and supporting nonlethal effects. They may include an assault to close with and destroy enemy forces. In an ambush, ground objectives do not have to be seized and held.

4-38. The ambush is more important, more effective, and more frequently used during jungle combat than any other type of offensive operation. Jungle terrain provides many opportunities for a well-concealed force to gain surprise which is essential for a successful ambush. Destruction of enemy forces is the primary purpose of most ambushes, but other benefits result from a successful ambush including the—

- Disruption of enemy operations, since troops become reluctant to move and fight in areas where ambushes are frequent.
- Capture of detainees and equipment which may yield intelligence data.
- Capture of supplies, thus increasing combat effectiveness at the expense of the enemy. In some instances, this is the primary source of supplies for guerrilla forces.

4-39. Commanders chose a location for an ambush after carefully analyzing the terrain, maps, aerial imagery, and reconnaissance data. The site chosen must contribute to the surprise of the ambush. Covered avenues of approach and withdrawal, good fields of fire, and canalization of the enemy are characteristics of a good ambush site. Troops always reconnoiter and approach an ambush site from the rear.

4-40. Camouflage is one of the most important aspects in the ambush. Ideally, troops fire weapons through screens of undisturbed, living foliage. Before the ambush, Soldiers/Marines remove any spoilage resulting from the position's preparation. Successful ambushes require discipline; troops on an ambush must be prepared to remain in the same position for hours at a time without sudden movements or noise. If individuals or teams must be relieved from the ambush site to rest or recover, commanders rotate them so only a few troops move at any one time. Relief rotations should never remove more than 25 percent of the ambush force from their position at any single time.

Defense Against Ambush

4-41. Since ambushes occur frequently during jungle operations, a unit moving through the jungle must take all possible measures to reduce its vulnerability to ambush. The most effective means of countering an ambush is to detect it before entering the kill zone.

4-42. Dismounted troops have an advantage over mounted troops in avoiding ambushes because they do not have to move on roads or trails. Effective commanders of dismounted units make a map and analyze aerial

reconnaissance to detect likely ambush sites and plan routes accordingly. During movement, troops maintain security to the front, rear, and flanks at all times (see figure 3-3 on page 3-14). Alert troops, good noise discipline, and well-rehearsed signals can reduce the unit's chances of ambush. Accurate land navigation, continuous fire support planning, and well-rehearsed reactions to ambush battle drills also reduce an enemy's potential for an effective ambush.

4-43. Mounted forces also require SOPs and TTP to defend against and react to an ambush. The limited number and often narrow nature of LOCs in the jungle makes mounted forces particularly vulnerable to ambush. This is especially true where the foliage grows up to the edge of the road. To mitigate this risk, commanders carefully plan and deliberately control mounted movement and convoy operations. When possible, they vary routes and movement times to prevent setting a predictable pattern for the enemy. Armored vehicles should escort convoys, and traffic information should be carefully guarded. Fire planning, route selection, and reconnaissance are important for mounted troops as well as for dismounted troops. (For the react to ambush task steps and performance measures, see ATP 3-21.8.)

Counterattack

4-44. Counterattacks occur after an enemy attacks friendly forces and it signals the transition to offensive operations. Units conduct counterattacks to prevent the enemy from exploiting initial penetrations and from consolidating gains. Commanders may employ their reserve to conduct a counterattack. Troops in the penetration area remain in their positions and continue to support the counterattacking force. If they leave their positions while the enemy is being expelled, they increase the risk of fratricide by the counterattacking force.

EXPLOITATION

4-45. An *exploitation* is a type of offensive operation that usually follows a successful attack and is designed to disorganize the enemy in depth (ADP 3-90). JP 2-01.3 defines *exploitation* as an offensive operation that usually follows a successful attack and is designed to disorganize the enemy in depth. The Marine Corps amplification is an offensive operation following a successful attack that is designed to disorganize the enemy in depth. It extends the initial success of the attack by preventing the enemy from disengaging, withdrawing, and reestablishing an effective defense (MCRP 1-10.2). Exploitations seek to disintegrate enemy forces to the point that they have no alternative but to surrender or retreat. Divisions and higher echelons normally plan exploitations as branches or sequels.

4-46. Commanders consider exploiting successful offensive operations by conducting air assault operations to block the enemy withdrawal, defeat the enemy reserve, or disrupt logistical operations. If air assault forces are not available, commanders employ CAS and indirect fire to block enemy escape routes. If acceptable LOCs are available, armor can play a vital role in exploiting successful offensive operations and pursuing a withdrawing enemy. However, commanders exercise caution to ensure that units secure support and consolidation areas so that bypassed enemy forces do not disrupt friendly operations.

PURSUIT

4-47. A *pursuit* is a type of offensive operation designed to catch or cut off a hostile force attempting to escape, with the aim of destroying it (ADP 3-90). A *pursuit* is an offensive operation designed to catch or cut off a hostile force attempting to escape, with the aim of destroying it (MCRP 1-10.2). Pursuits often follow successful exploitations. Pursuits entail rapid movement and decentralized control, which makes them difficult in the jungle. Difficult terrain and the precautions required to prevent ambush can slow pursuing forces. However, in the jungle, pursuit operations can prove extremely valuable since forces maintain contact with an elusive enemy. Commanders often employ their reserve to conduct a pursuit as this element is likely more rested and better equipped in the aftermath of successful offensive operations. If available, commanders use air assault forces and attack aviation to pursue a retreating enemy.

FORMS OF MANEUVER

4-48. *Forms of maneuver* are distinct tactical combinations of fire and movement with a unique set of doctrinal characteristics that differ primarily in the relationship between the maneuvering force and the

enemy (ADP 3-90). The forms of maneuver consist of envelopment, frontal assault, infiltration, penetration, and turning movements. Forms of maneuver often form the basis for a COA. Terrain restrictions common in the jungle often preclude the conduct of envelopments and penetrations; however, frontal assaults, turning movements, and infiltrations can be effective in the jungle.

FRONTAL ASSAULT

4-49. A frontal assault is a form of maneuver in which an attacking force seeks to destroy a weaker enemy force or fix a larger enemy force in place over a broad front. A commander commonly uses a frontal assault as a shaping operation in conjunction with other forms of maneuver. Commanders primarily use a frontal assault to maintain pressure and fix the enemy force. This is particularly important during jungle operations where locating and fixing the enemy can prove exceedingly difficult given the dispersed nature of operations and restrictive terrain. Frontal assaults are effective when the enemy has massed across a wide area and may be the preferred form of maneuver for a spoiling attack.

4-50. During jungle operations, the enemy rarely forms a continuous broad front. Instead, the enemy may mass along a linear front in a series of defensible strong points on terrain features such as hills or mountains. When executing a frontal assault against an enemy arrayed in this manner, the attacking force seeks to discover a gap in the enemy's defenses. The commander can then exploit that weakness and disrupt the integrity of the enemy's defense. Once troops detect a gap, the commander weights the exploiting force with additional forces, priority for support, or priority for indirect fires or CAS. The commander may also employ the reserve to further exploit the gap or secure the shoulders of the breach. The other attacking forces maintain pressure on the enemy defenses to fix them in place and enable continued success by the exploiting force.

INFILTRATION

4-51. Jungles are ideal for infiltration. An *infiltration* is a form of maneuver in which an attacking force conducts undetected movement through or into an area occupied by enemy forces to occupy a position of advantage behind those enemy positions while exposing only small elements to enemy defensive fires (FM 3-90-1). An *infiltration* is the movement through or into an area or territory occupied by either friendly or enemy troops or organizations. The movement is made, either by small groups or by individuals at extended or irregular intervals. When used in connection with the enemy, it implies that contact is avoided (MCRP 1-10.2). The jungle's dense vegetation and rugged terrain limit the enemy's ability to detect infiltration and provide friendly forces with the cover and concealment to move behind enemy lines. As such, infiltration is the primary form of maneuver when conducting raids. Normally dismounted forces conduct jungle infiltrations; however, under certain circumstances infiltrating units may use helicopters or watercraft.

4-52. Infiltrations require careful control measures to synchronize operations and prevent fratricide. Common infiltration control measures include phase lines, rally points, infiltration lanes, linkup points, and clearly understood recognition signals. Units move in small teams from their assembly areas along infiltration lanes to the objective using linkup points for control and coordination. In accordance with METT-TC/ METT-T, units designate an objective rally point to reassemble into a coherent unit and make all final preparations before conducting the ensuing attack. An *objective rally point* is an easily identifiable point where all elements of the infiltrating unit assemble and prepare to attack the objective (ADP 3-90). An infiltration lane is a control measure that coordinates forward and lateral movement of infiltrating units and fixes fire planning responsibilities. Commanders avoid using roads, trails, and streams as infiltration lanes as these are likely under enemy surveillance. A linkup point is where two infiltrating elements in the same or different infiltration lanes are scheduled to meet to consolidate before proceeding with their missions. Because infiltrations require divergent units to link up in areas where the enemy is present, the risk for fratricide is greater than in other forms of maneuver. To mitigate the risk of fratricide, commanders ensure that Soldiers/Marines rehearse infiltrations and understand control measures and recognition signals.

4-53. SOF and light infantry units battalion size and smaller are best suited to conduct an infiltration. Well-planned and resourced deception operations can divert the enemy's focus from the infiltrating forces. Forces can conduct indirect fire in areas away from infiltration lanes to divert the enemy's attention and mask the sounds of infiltrating forces. The difficulty of infiltration increases with the size and number of units involved. Infiltrations are also more difficult when Army/Marine Corps forces face a hostile civilian population. Under such circumstances, infiltration by conventional forces may be impossible

4-54. Infiltrations require accurate intelligence to prevent them from becoming costly and time-consuming probing operations. Accurate intelligence, aggressive reconnaissance, and detailed imagery enable an infiltrating force to avoid the enemy's security force, minimize direct contact, and maximize surprise. Staffs can use a thorough terrain analysis, combined with a detailed MCOO and enemy situation template, to graphically depict dead spots in the enemy's battlefield surveillance. The commander can then plan how to expand those existing dead spots into infiltration lanes through a precision attack on selected enemy systems.

4-55. Detailed intelligence and imagery enable the commander to identify the appropriate number of infiltration lanes. When determining the number of infiltration lanes to use, the commander and staff consider the size of the infiltrating force, the enemy disposition, the terrain, and the time available. Commanders also consider whether infiltrating forces should be within supporting distance or range of each other and may plan infiltration lanes accordingly.

4-56. A single infiltration lane—

- Facilitates navigation, control, and reassembly.
- Requires the existence or creation of only one gap in the enemy's position.
- Reduces the area for which detailed intelligence is required.

4-57. Multiple infiltration lanes—

- Require the existence or creation of multiple gaps in the enemy's position.
- Reduce the possibility of compromising the entire force.
- Increase difficulty with maintaining control.

4-58. In addition to planning for infiltration, the commander and staff plan for the extraction of the infiltrating force. The extraction plan not only details the method of extraction after mission completion, but also provides extraction instructions for compromised forces and casualties. During jungle operations, the ability to reinforce or extract forces quickly is challenged by the restrictive terrain and the difficulties associated with mounted operations. To mitigate this, units identify potential helicopter landing zones adjacent to infiltration routes and the objective to use to extract forces.

4-59. Commanders provide abort criteria and clearly designate the authorities for aborting the mission. Staffs develop abort criteria and associated decision points during the planning process and transmit information to all involved subordinate headquarters. Examples of potential abort criteria include:

- Significant portions of the infiltrating force's combat power are lost through navigation errors, enemy action, accidents, or maintenance failures.
- Enemy movement or significant reinforcement at the objective.
- Compromise by the enemy.
- Changes in the tactical situation that make the mission no longer appropriate, such as the initiation of an enemy attack.

4-60. If the infiltrating force makes contact with the enemy during their movement, they can either break contact and bypass the enemy along another infiltration lane, abort the mission, or overrun the enemy and continue the mission. Preferably, actions on contact are conducted by the forward reconnaissance force or the smallest unit possible while the main body moves to another infiltration lane, reconstitutes a forward reconnaissance force, and continues the mission. The infiltrating force ignores largely ineffective enemy fire and continues to move towards the objective.

TURNING MOVEMENT

4-61. A *turning movement* is a form of maneuver in which the attacking force seeks to avoid the enemy's principle defensive positions by seizing objectives behind the enemy's current positions thereby causing the enemy force to move out of their current positions or divert major forces to meet the threat (FM 3-90-1). Attacking the enemy's flank or rear may draw the enemy away from its current line of operation or force it to abandon a position by requiring it to divert forces in response to the attack. While typically conducted by division-sized forces or larger, turning movements in the jungle may consist of large ambushes or raids in the enemy's rear or flank conducted by battalions or brigades. Turning movements in the jungle are best conducted using air assault, waterborne, or riverine forces. These operations require detailed intelligence of

the enemy's location, disposition, and objectives to ensure a larger enemy force does not cut off and isolate attacking forces. These operations also rely on the availability of aviation support or viable rivers to rapidly move friendly forces into position for the attack.

WARFIGHTING FUNCTION CONSIDERATIONS

4-62. Each battle or engagement has unique characteristics, such as the types of weapons, degree of tactical mobility, and the influence of various effects across multiple domains. Commanders most likely to enjoy tactical success are those able to visualize the battlefield, understand the implications of existing friendly and enemy dispositions, and take effective action first. Commanders maintain this momentum by following up attacks quickly to deny enemy forces any opportunity to adjust or adapt to the new situation. The tempo of friendly operations must be fast enough to prevent effective enemy counterattacks. Commanders maintain pressure by adjusting combinations of friendly capabilities to exploit initial gains and create further dilemmas for the enemy.

4-63. The following considerations in paragraphs 4-64 through 4-79, organized by warfighting function, are not unique but apply to offensive operations in the jungle environment.

INFORMATION

4-64. The information warfighting function supports offensive operations by deceiving the enemy, damaging enemy morale, and providing noncombatants with methods for avoiding areas where combat is likely. Military deception (MILDEC) and MISO are the primary types of information operations conducted during the offense. MISO teams conduct information operations in the offense to encourage adversary forces to defect, desert, flee, or take any other action beneficial to friendly forces. MISO teams also conduct these operations to degrade enemy command and control. Methods for MISO include face-to-face engagements, the use of loudspeakers, distribution of leaflets, radio and television broadcasts, and the use of internet-supported communications including social media. Commanders use MILDEC to deceive the enemy and protect the main effort. MILDEC is used to—

- Achieve surprise.
- Preserve friendly forces, equipment, and installations from destruction.
- Minimize an enemy's advantage.
- Gain time.
- Cause an adversary to deploy forces or capabilities prematurely or in a manner or location advantageous to friendly forces.
- Cause an adversary to waste combat power with delayed or inappropriate actions; thereby ceding initiative to friendly forces.
- Influence the adversary's intelligence collection focus.
- Condition the adversary to particular patterns of friendly behavior that friendly forces can exploit later.

COMMAND AND CONTROL

4-65. Commanders may require additional signal support, such as retransmission teams, joint network node signal assets, satellite communications, and tactical radio communications to facilitate command and control across large offensive AOs in complex terrain.

4-66. All units conducting offensive operations should expect to operate in a degraded communications environment. Degradation may arise from environmental circumstances, enemy action directed against friendly communications and information systems, or malfunctions. A degraded communications environment may be permanent or temporary. The use of mission orders and commander's intent is critical to remaining effective in a degraded communications environment. Soldiers/Marines train to navigate without the aid of GPS-enabled devices. (See Appendix A for more information on navigation techniques.)

4-67. The difficulty of movement and maneuver, size of the AO, probability of degraded communications, and sudden lethality of the jungle environment often exposes any weakness in command and control by the

commander. Commanders must rely on their subordinate leaders and staff, enabled by mission command/command and control to achieve their intent and end state in the jungle environment.

MOVEMENT AND MANEUVER/MANEUVER

4-68. Jungle operations often involve rivers and other gaps as frequent obstacles. Wet gap crossings are among the most critical, complex, and risky combined arms operations. Forces conduct hasty crossings as a continuation of the attack whenever possible because the time needed to prepare for a deliberate gap crossing allows enemy forces more time to strengthen their defense. The size of a gap, as well as the enemy and friendly situations, dictates the specific TTP used to conduct a crossing. The jungle requires more gap crossing simply because the environment has limited infrastructure and more rivers and streams. (See ATP 3-90.4/MCTP 3-34A (MCWP 3-17.8) for more information on gap crossing. See Appendix B for techniques unique to wet gap crossings in the jungle.)

4-69. Commanders can protect maneuvering forces and deceive the enemy by using obscurants. Before using obscurants, commanders acknowledge that using obscurants can betray friendly positions. Commanders employ obscuration in the offense to—

- Protect friendly forces.
- Degrade enemy reconnaissance, surveillance, and target acquisition systems.
- Deceive enemy commanders.

4-70. The ability to fight at night, under limited-visibility conditions, or while employing obscuration is an important aspect of conducting maneuver. The performance of tasks and the conduct of operations under these conditions reduce the risk of detection and enemy targeting. Offensive operations conducted in these conditions can achieve surprise and make enemy visual target acquisition more difficult. They also take advantage of a friendly force's ability to maneuver and employ fires under limited-visibility conditions. In dense vegetation, units may need to use some of the same control techniques during night operations that they used during the day.

INTELLIGENCE

4-71. The cover and concealment afforded by jungle terrain and foliage make it especially challenging for the development and distribution of real time intelligence products to inform the commander and staff during offensive operations. Situation templates address terrain, mobility corridors, artillery range fans, movement times between enemy reserve assembly area locations and advancing friendly forces, and other related intelligence variables. However, situation templates lose their value when real time intelligence products are not available to support decision making.

FIRES

4-72. Fire support is essential in the jungle. Given the challenges associated with employing heavy weapons and armor over restrictive terrain, dismounted forces often rely on small arms and light crew served weapons during offensive jungle operations. Indirect fire support is therefore critical in making up for maneuver forces' lack of firepower in the jungle. To mitigate this, units must pinpoint targets by reconnaissance and adjust fires within very close range of attacking troops.

4-73. As an attacking force moves forward, preparation fire sequentially suppresses or destroys enemy positions. Commanders assess the impact and likelihood of losing a degree of surprise and increasing their vulnerability to counterfire when determining whether to execute preparation fire. Commanders may also decide to employ precision munitions against selected high-payoff targets to negate the requirement for long duration preparation fires using standard munitions.

4-74. *Preparation fire* is normally a high volume of fires delivered over a short period of time to maximize surprise and shock effect. Preparation fire include electronic attack and should be synchronized with other electronic warfare activities (FM 3-09). Conventional preparation fire generally ceases once friendly forces are engaging the enemy with direct fire; however, EW may continue to disrupt the enemy's command, control, and communications network through jamming. Commanders can also conduct offensive cyber operations to further degrade the enemy's ability to gather intelligence or command and control forces.

4-75. Commanders attempt to have air defense assets in direct support of their attack. Such coverage generally weights toward the unit's decisive operation. It also establishes a protective corridor over the terrain traversed by units conducting that operation. Commanders employ passive air defense measures as an essential part of air and missile defense planning at all levels. Using passive air defense measure reduces the effectiveness of the enemy air threat.

SUSTAINMENT/LOGISTICS

4-76. Sustainment/logistics maintains the momentum of an attack by delivering supplies as far forward as possible. Sustainment/logistics commanders must act, rather than react, to support requirements. The existence of habitual support relationships facilitates the ability to anticipate requirements.

4-77. Because most forces conducting offensive jungle operations are dismounted, the requirement for additional petroleum, oils, and lubricants is less than during offensive operations in other environments. However, the limited LOCs, potentially high casualties, and restrictive terrain complicate casualty evacuation and increase requirements for Class VIII resupply. Medical planners must anticipate this increased demand. Maneuver forces plan and rehearse ground-based casualty evacuation procedures and identify helicopter landing zones that support their scheme of maneuver.

4-78. Effective commanders do not use aerial resupply as the primary method of sustainment for offensive jungle operations. The lack of drop zones, the likelihood that the enemy may capture supplies, and the potential for resupply aircraft to betray the location of friendly forces make aerial resupply extremely risky.

PROTECTION

4-79. Protection considerations in the offense consist of both active and passive measures. OPSEC is critical, and commanders take measures to prevent compromising sensitive information about pending operations with HN forces. Commanders adjust movement formations based off the threat from both ground and air attacks. Patrols avoid travelling along trails, roads, and streams to mitigate the risk of ambush. If a CBRN threat exists, leaders ensure their Soldiers/Marines adhere to the proper MOPP protocol and adjust the work/rest cycle to reduce the risk of heat injuries and dehydration.

CONSOLIDATE GAINS

4-80. Because they occur in portions of the AO where large-scale combat operations have ended, consolidating gains in the jungle can serve as a transition from offensive operations to stability operations. These efforts primarily consist of reducing bypassed or encircled enemy forces and securing the local populace. Because of the lack of existing infrastructure, consolidating gains in the jungle can be simpler than in other environments; however, the mobility difficulties associated with jungle terrain can challenge commanders to effectively locate, isolate, and defeat bypassed enemy forces. These same mobility difficulties also challenge leaders to survey and address stabilization requirements across the AO.

4-81. *Consolidate gains* are activities to make enduring any temporary operational success and to set the conditions for a sustainable security environment, allowing for a transition of control to other legitimate authorities (ADP 3-0). Because jungle operations generally orient on the enemy, not terrain, and are executed in noncontiguous AOs, consolidating gains in the jungle requires a different approach than in other environments. Consolidating gains is further complicated by the harsh terrain, limited existing infrastructure, and sparse population of most jungle areas. These conditions make it appear as though consolidating gains in the jungle wastes combat power; as if the limited infrastructure and sparse population do not warrant security or stability efforts. However, to achieve lasting success in the jungle, commanders cannot neglect to consolidate gains. Instead, they tailor consolidation activities to the local environment, the populace, and the enemy.

4-82. Consolidation activities in the jungle are characterized by limited offensive operations and area security tasks conducted in concert with basic stability operations tasks. After major engagements, commanders pursue the enemy and deny them the ability to protract the conflict or continue resistance. Under these conditions, consolidation activities consist primarily of search and attack and cordon and search operations to identify and defeat enemy forces attempting to evade capture. Commanders must control and

account for each captured and killed enemy combatant as well as ensure they exploit the information collected from combatants to drive future operations. Soldiers/Marines confiscate and properly dispose cached weapons and supplies so they cannot be used to prolong the conflict. After the cessation of large-scale combat, commanders do not abandon villages and other population centers, but, instead, secure them by allocating a task-organized security force able to protect civilians from enemy harassment and infiltration.

4-83. After remaining enemy forces are defeated, operations to consolidate gains in the jungle are guided by two fundamentals: control the essential and distinguish combatants from noncombatants. Controlling the essential guides commanders by helping them identify what must be secured and improved to make tactical gains enduring. The jungle is often too large and sparsely populated to consolidate gains across an entire AO. Instead, commanders consolidate gains by directing their forces and resources at key population centers and infrastructure. In the jungle these may be villages, ports, airfields, food storage sites, and key bridges or roads. Commanders also ensure Soldiers/Marines practice restraint by carefully distinguishing between combatants and noncombatants; enemy forces may attempt to blend in with the local populace and troops must take every precaution to avoid inadvertently attacking noncombatants.

4-84. Despite the emphasis on area security, commanders cannot neglect the minimum required stability tasks necessary to return areas under their control to pre-hostility conditions. Given the lack of infrastructure and rural nature of most jungles, stability efforts are often less intensive than in more developed environments. However, assessing what resources are required to stabilize the AO and then transporting the requisite items to the point of need requires careful planning and additional transportation assets to overcome the jungle's restrictive terrain. Commanders employ civil affairs units and work with HN or local leaders to identify and address the population's concerns. They also leverage NGOs or IGOs that are familiar with the area to determine what is needed and how the joint force can aid overall stabilization efforts. Often, rural areas need only basic or rudimentary initiatives to restore to their pre-hostility condition, and these efforts can simultaneously serve as powerful information operations to garner support for U.S. objectives.

4-85. Units involved in the close area and in close combat do not conduct consolidation of gains activities. A separate maneuver force conducts consolidation of gains activities in the designated consolidation/rear areas in the jungle environment.

4-86. To consolidate gains effectively and efficiently, commanders need to clearly understand both the purpose of the operation and all potential enemy capabilities to resist. The critical assumption for planning is that enemy forces will use all means at their disposal and seek new means to protract a conflict. It is the simultaneous exploitation of existing advantage and the rapid pursuit of remaining means of resistance that deny an enemy the ability to prolong conflict after the initial enemy forces are defeated. This exploitation and pursuit can involve many lines of effort or operations including—

- Physically seizing storage areas containing weapons, munitions, and fuel; seizing server farms, radio and television stations; seizing barracks and police stations; seizing key terrain; securing LOCs; and providing for the security and continued operation of essential services such as water, sewer, trash, and electric services.
- Controlling HN or enemy security and police forces, to include gaining accountability of those not already captured. HN or enemy security and police forces are used to maintain order wherever possible.
- Rapidly controlling population centers to establish order and prevent looting, rioting, or unrest.
- Rapid and comprehensive use of information operations to shape public opinion, discredit enemy narratives, and promote friendly narratives.

4-87. Commanders conduct essential stability tasks and functions to consolidate gains. Commanders may transition essential stability tasks to other forces or appropriate civilian organizations if they can perform them. For example, sufficient HN civilian or military governance may exist to ensure that the population has adequate food and medical care. There are specific portions of the jungle environment, such as large expanses of rain forests and swamps, where consolidation of gains may only consist of denying the enemy access or refuge in these areas.

4-88. Commanders often require key enablers to adequately conduct consolidation of gains. Units may need engineers to improve routes and rebuild basic infrastructure or housing. Military police act as a force multiplier capable of conducting population and resources control (PRC) throughout the consolidation area.

Military police support to population control consists of ensuring that dislocated civilians do not interfere with ongoing operations to consolidate gains. Once offensive operations end, military police help control and direct indigenous persons and refugees move back to their homes. Military police perform resource control by securing natural and manmade materiel resources to deny the enemy access, prevent looting or exploitation, and preserve vital resources for future requirements. (See chapter 6 and ATP 3-39.30 for more information on PRC.)

4-89. A civilian population's perception of legitimacy affects how it reacts to military forces. Forces establish credibility and legitimacy with a local population in the way they conduct operations. Adversaries often seek legitimacy by assuming roles that gain favor with the population, such as resolving disputes, influencing key social leaders, providing essential services, or providing protection from criminal elements. Consolidation of gains activities may ultimately decide who possesses the ability to compel, control, influence, and gather support from a population. Therefore, throughout jungle operations, Army/Marine Corps leaders have legal and moral responsibilities to establish area security and restore services while countering the efforts of those working against friendly goals. (See JP 3-07, ADP 3-07, and MCWP 3-03 for further information on legitimacy and other stability considerations.)

CONSOLIDATION AREA FRAMEWORK

4-90. During large-scale combat operations, a consolidation area framework designates the portion of the land commander's AO to facilitate freedom of action, consolidate gains through decisive action, and set conditions to transition the AO to follow-on forces or other legitimate authorities. In the consolidation area, forces have established a level of control so they can perform tasks to consolidate gains. The consolidation area may or may not contain support areas focused on support to forward deployed units. Assigning a consolidation area to a subordinate headquarters allows the higher echelon headquarters to adequately focus resources on close operations and allows a subordinate headquarters to make progress towards consolidating gains and achieving desired objectives. It is the first step towards the overall consolidation of gains during large-scale combat operations.

4-91. Commanders should plan for and assign forces to the consolidation area as soon as possible to allow close combat forces to focus on operations in the close and deep areas. A key component is requesting critical authorities to ensure effective application of such things as ROE, direct liaison, cyberspace missions, and information operations. By smoothly transitioning consolidation areas to follow-on forces as close areas are secured, the commander enables close combat forces to maintain the initiative and maneuver without loss of momentum.

Note. A consolidation area requires additional combat power and is not intended to draw forces from the close or deep area.

CONSOLIDATION OF GAINS ACTIVITIES

4-92. Normally, most of a unit's efforts focus on conducting area security/rear area security at the onset of operations to consolidate gains in the jungle. Area security/rear area security includes activities to protect friendly forces, installations, and routes within a specific area. The protected forces and installations may be the civilian population, civil institutions, and civilian infrastructure. The weight of effort shifts toward the performance of stability tasks as the security environment improves. Ultimately, a commander transfers control of the area to a legitimate civil authority. Commanders should consider the progression of capabilities with respect to force structure over time as area security/rear area security and minimal-essential stability objectives give way to more intensive stability operations tasks. This unique transition will likely require additional force tailoring to ensure enough engineers and civil affairs units are available, while releasing security forces, such as military police, for operations elsewhere. (See chapter 6 for more detailed information on stability operations in the jungle.)

4-93. *Area security* is a type of security operation conducted to protect friendly forces, lines of communications, and activities within a specific area (ADP 3-90). The security force may be protecting the civilian population, civil institutions, or civilian infrastructure. Areas to secure may range from specific points

(for example, bridges and defiles) and essential infrastructure (including water treatment and electrical generation facilities) to large civilian population centers and their adjacent areas. Population-centric area security missions are common across the range of military operations in the jungle environment, but they are a requirement during irregular warfare. Population-centric area security typically combines aspects of the area defense and the offense, like search and attack and cordon and search, to eliminate internal defense threats.

4-94. The Marine Corps conducts rear area security, which includes measures taken prior to, during, and/or after an enemy airborne attack, sabotage, infiltration, guerrilla action, and/or initiation of psychological or propaganda warfare to minimize the effects thereof. The Marine air-ground task force rear area is defined as that area extending rearward from the rear boundary of the ground combat element and the Marine air-ground task force rear boundary.

4-95. Area security forces in the jungle retain readiness over long periods with intermittent enemy contact. The enemy normally tries to avoid engaging friendly forces except on favorable terms. Forces performing area security avoid developing a false sense of security, even if the enemy appears to have ceased operations in a particular area. Commanders assume that the enemy continuously observes friendly operations and seeks an opportunity to attack when it feels it has the advantage.

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Chapter 5
Jungle Defensive Operations

This chapter outlines the purpose and characteristics of jungle defensive operations. It also provides information on the characteristics of the defense and forms of the defense applicable to jungle operations.

DEFENSIVE OPERATIONS

5-1. A *defensive operation* is an operation to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive or stability operations (ADP 3-0). *Defensive operations* are operations conducted to defeat an enemy attack, gain time, economize forces, and develop conditions favorable to offensive and stability operations. The three types of defensive operations are area, mobile, and retrograde (MCRP 1-10.2). However, the performance of defensive operations alone normally cannot achieve a decision. Defensive operations create conditions for a counteroffensive that allows Army/Marine Corps forces to regain the initiative. Other reasons for performing defensive operations include—

- Retaining decisive terrain or denying a vital area to an enemy.
- Conducting defensive covering force operations to protect forces elsewhere in the theater of operations.
- Attriting or fixing an enemy as a prelude to offensive operations.
- Countering an enemy attack.
- Forcing the enemy to concentrate their forces.
- Freeing friendly forces in one area for offensive operations elsewhere.

5-2. The defense provides time for a commander to build combat power and establish conditions to transition to the offense. Although stronger than the offense, a defender may be disadvantaged early in a campaign if the enemy can determine when and where to attack. In immature theaters, the defender may lack the resources to prepare for an attack. A successful defense integrates fires, maneuver, air and missile defense, and countermobility effects to degrade, delay, or defeat the enemy while providing the defender enough time and space to build combat power.

5-3. Commanders have several considerations when planning a defense. Keys to a successful defense are—

- Timely detection of the enemy's COA.
- Concentration of effects at the decisive time and place.
- Depth.
- Security (forward, flank, area, and local security in support areas).
- Engagement area development (shape and exploit terrain advantageously).
- Preparation.
- Flexibility.
- Designation, composition, location, and employment of the reserve.
- Timely resumption of the offense.

5-4. While conducting a defense, commanders integrate the elements of decisive action by executing offensive shaping operations across all domains. Offensive shaping operations may target enemy forces echeloned in depth or their sustainment capabilities. Spoiling attacks can upset enemy preparations by disorganizing subordinate components of the enemy's plan. The commander may execute offensive cyberspace, EW, or information operations timed to disrupt enemy command and control at critical phases in the operation. During jungle defensive operations, commanders may ambush enemy patrols as they

position for the attack. These shaping actions set conditions for decisive action, such as the defeat of the enemy's main effort by a counterattack that enables the friendly force to transition to offensive operations.

5-5. Defensive operations in the jungle require special planning considerations to account for the dense foliage, lack of LOCs, and restrictive terrain. Challenges to defensive operations in the jungle include:

- Condensed reaction time. Thick foliage and mountainous terrain can mask the attacker's movement and make it more difficult to determine the direction and timing of an enemy attack.
- Slower movement. Mobility challenges make it more difficult to reinforce units or move between subsequent battle positions.
- Condensed AOs. Limited visibility and fields of fire require battle positions be placed close together to provide mutual support.
- Limited standoff. Dense vegetation necessitates engagements at close proximity and can prevent units from effectively employing direct fire into engagement areas at maximum effective ranges.
- Indirect fire constraints. Engagements at close proximity can constrain or completely restrict the use of indirect fire.
- Challenges to direct fire engagements. Thick foliage and complex terrain limit fields of fire and increase dead space.

5-6. Units can conduct defensive operations during any phase of a campaign. They may follow after a successful offense to enable consolidation of gains or early in a campaign to retain or protect the infrastructure necessary to move additional forces into the theater of operations. Examples of key locations or infrastructure that require protection include:

- Critical infrastructure, such as ports, key logistic installations, roads, railroads, bridges, airfields.
- Natural features, such as mountain passes, water ways, or other key terrain.

5-7. Sometimes a unit must establish a defense with minimum planning time. This normally occurs when an attack stalls, at dusk when the unit remains in contact with the enemy and has no night attack planned, or when a unit needs to secure an intermediate objective before continuing the attack. These situations often prove more dangerous in the jungle since the restrictive terrain and dense foliage enable the attacking force to capitalize on the element of surprise.

DEFENSIVE CHARACTERISTICS

5-8. Characteristics of the defense include disruption, flexibility, maneuver, mass and concentration, operations in depth, preparation, and security. The defensive plan incorporates these characteristics to disrupt and attrit an attacker throughout the depth of the enemy formation to establish conditions for the transition to offensive operations.

DISRUPTION

5-9. Defenders disrupt attacks by employing actions that frustrate the enemy's ability to coordinate or synchronize operations. Disruption actions include deceiving or destroying enemy reconnaissance forces, breaking up combat formations, separating echelons, and impeding the enemy's ability to synchronize and employ combined arms. Defenders conduct spoiling attacks to deny an enemy the ability to focus combat power. They counterattack to deny the enemy the ability to exploit any gains. Defenders employ EW and cyberspace assets in addition to lethal systems to target enemy command and control systems and disrupt enemy forces in depth by isolating forward echelons from their higher headquarters.

5-10. Commanders use a combination of ambushes, indirect fire, and spoiling attacks to disrupt enemy offensive operations in the jungle. When enemy formations cannot be located, commanders direct these operations towards the limited number of LOCs available in the AO that could be used by the enemy to build combat power. Severing the enemy's LOCs and depriving the enemy of the troops and supplies necessary to continue offensive operations can severely disrupt the enemy's tempo.

FLEXIBILITY

5-11. The defense requires flexible plans that anticipate enemy actions and allocate resources accordingly. Commanders shift the main effort as required. They plan battle positions in depth and the use of reserves in spoiling attacks and counterattacks.

5-12. Given the noncontiguous nature of jungle operations, commanders build flexibility into the defense by retaining a highly mobile reserve capable of responding to enemy attacks. If possible, the reserve is air mobile or air assault capable in order to overcome the mobility restrictions inherent in most jungles. Air assault forces provide the commander with a flexible, rapid response once the enemy's scheme of maneuver is determined.

MANEUVER

5-13. Maneuver allows a defender to achieve and exploit a position of advantage over an enemy. Defending forces are not static and, instead, seek opportunities to maneuver against the attacking force. They avoid becoming fixed and use various battle positions to conduct operations in depth.

5-14. Because mobility is limited and AOs are often noncontiguous, commanders carefully consider how subordinate forces can mutually support each other during defensive operations in the jungle. Commanders study the terrain and assign subordinate AOs that permit maneuvering forces from one location to another. If pre-existing LOCs do not support the defensive plan or scheme of maneuver, commanders use engineers to clear paths and trails between units. However, these new LOCs should not betray the location of friendly forces or the friendly scheme of maneuver.

MASS AND CONCENTRATION

5-15. Defenders seek to mass and concentrate the effects of overwhelming combat power to support their decisive operations. Defending commanders may surrender ground to gain time to concentrate combat power. During jungle operations, mass and concentration can often only be achieved locally and with the use of a highly mobile reserve. To accomplish this, commanders position the reserve where it can best leverage interior lines to respond and defeat the enemy's decisive operation.

5-16. Commanders designate, retain and, when necessary, reconstitute a reserve. They employ their reserve to exploit counterattack opportunities, regain local superiority, preserve the integrity of the defense, and prevent culmination. They reconstitute their reserve from other forces once it is committed. The large, noncontiguous AOs characteristic of jungle operations may require the commander conduct economy of force operations in less threatened areas in order to constitute a reserve large enough to concentrate forces at the decisive point.

OPERATIONS IN DEPTH

5-17. *Operations in depth* are the simultaneous application of combat power throughout an area of operations (ADP 3-90). Operations in depth can be both offensive and defensive in nature. Offensive operations in depth set conditions by destroying or disrupting enemy long-range fires, air and missile defense, sustainment/ logistics, and command and control across multiple echelons. Defensive operations in depth employ alternate and subsequent battle positions to facilitate flexibility and hasten the enemy's culmination. Operations in depth prevent the enemy from maintaining the momentum of an attack. Commanders plan defensive operations in depth by establishing a security area and a main battle area. A *security area* is that area that occupied by a unit's security elements and includes the areas of influence of those security elements (ADP 3-90). A *security area* is the area that begins at the forward edge of the battle area and extends as far to the front and flanks as security forces are deployed, normally to the forward boundary of the area of operations. Forces in the security area conduct reconnaissance to furnish information on the enemy and to delay, deceive, and disrupt the enemy (MCRP 1-10.2). The *main battle area* is the area where the commander intends to deploy the bulk of the unit's combat power and conduct decisive operations to defeat an attacking enemy (ADP 3-90). The *main battle area* is that portion of the battlespace in which the commander conducts close operations to defeat the enemy. Normally, the main battle area extends rearward from the forward edge of the battle area to the rear boundary of the command's subordinate units (MCRP 1-10.2).

5-18. Conducting operations in depth in the jungle often requires modifying TTP, especially in the security area. Instead of committing large formations to reconnaissance operations in the security area, commanders instead use dismounted, light infantry and cavalry teams to patrol and screen along likely enemy avenues of approach. These forces collect information on enemy movements, disposition, and composition to assist the commander in determining the enemy scheme of maneuver and course of action. They harass the enemy to disrupt their preparations, but must maintain a mobility advantage over enemy forces to avoid becoming decisively engaged.

PREPARATION

5-19. Defenders arrive in their AOs before the attacker and use the available time to prepare. Defenders study the terrain, the enemy, and the situation template to prepare engagement areas (EAs). An *engagement area* is an area where the commander intends to contain and destroy an enemy force with the massed effects of all available weapons and supporting systems (ADP 3-90). An *engagement area* is an area where the commander intends to contain and destroy an enemy force with the effects of massed weapons and supporting systems (MCRP 1-10.2). Commanders employ natural and manmade obstacles to canalize attacking forces into EAs. They designate target reference points to drive attacking forces into EAs and then mass fire on the enemy once in the EA. A *target reference point* is a predetermined point of reference, normally a permanent structure or terrain feature that can be used when describing a target location (JP 3-09.3). Marine Corps amplification is an easily recognizable point on the ground (either natural or man-made) used to initiate, distribute, and control fires (MCRP 1-10.2). Commanders place information collection assets throughout their AOs to provide information and early warning of enemy actions. They position combat multipliers, such as fires and sustainment assets, to support their defensive plans. Defenders improve the survivability of their units by constructing field fortifications, using camouflage, and dispersing. Defending forces continue rehearsals and preparations until close combat begins.

5-20. Like defensive operations in other terrain, commanders conduct EA development by integrating direct fires, indirect fires, and obstacles into the defensive plan. However, EA development differs in the jungle as these activities are often concentrated along natural lines of drift and trails or other avenues of approach. Commanders also prioritize the use of mines and booby traps over obstacles that can be easily traversed by dismounted infantry or guerrilla forces.

SECURITY

5-21. Commanders secure their forces by conducting security, protection, and information operations and by performing cyberspace and EW tasks. Commanders employ forward and flank security forces to protect their defending forces and prevent surprise. *Security operations* are those operations performed by commanders to provide early and accurate warning of enemy operations, to provide the forces being protected with time and maneuver space within which to react to the enemy, and to develop the situation to allow commanders to effectively use their protected forces (ADP 3-90). Security operations prevent enemy intelligence, surveillance, and reconnaissance assets from determining friendly locations, strengths, and weaknesses. Protection efforts preserve combat power and commanders protect their forces from attrition by incorporating air and missile defense assets into the defensive plan. They conduct information operations to prevent civilian interference with their operations. MILDEC, cyberspace, and EW inaccurately portray friendly forces to mislead enemy commanders and deny those same enemy commanders the ability to use cyberspace and the EMS. Security may include providing area security for civilians, the infrastructure, LOCs, and other aspects of the echelon's support and consolidation areas.

5-22. Security operations in the jungle are critically important as the dense foliage and restrictive terrain provide the enemy with the cover and concealment necessary to conduct close reconnaissance against friendly forces. As such, commanders use a two-tiered security plan that employs counterreconnaissance forces in the security area to protect the main body from enemy observation, and long-range reconnaissance patrols to ascertain the enemy's scheme of maneuver, disposition, and composition. Dismounted reconnaissance and counterreconnaissance forces are critical to security operations in the jungle because the dense canopy often limits the ability of satellite or aerial reconnaissance assets to identify and collect on enemy forces.

TYPES OF DEFENSIVE OPERATIONS

5-23. There are three types of defensive operations: the area defense, the mobile defense, and the retrograde. The three unique operations present various challenges in planning and execution. Commanders can use any combination of the three types of defensive operations when developing their plan. An area defense orients on the retention of terrain by fixing the enemy with direct fire through a series of mutually supporting battle positions. A *battle position* is a defensive location oriented on a likely enemy avenue of approach (ADP 3-90). A *battle position* is in ground operations, a defensive location oriented on an enemy avenue of approach from which a unit may defend (MCRP 1-10.2). Units then destroy the enemy by focusing fires into the EA. The mobile defense orients on the destruction of the attacking force by permitting the enemy to advance into a position that exposes it to counterattack by a mobile reserve. Retrogrades seek to reposition friendly forces to improve an operational or tactical situation and often involve trading space for time to prepare a counterattack. Effectively combining all three types of defensive operations as part of a larger defensive plan requires commanders to leverage the unique capabilities of their subordinate units by task organizing them appropriately for the respective defensive operation they are executing.

AREA DEFENSE

5-24. The *area defense* is a type of defensive operation that concentrates on denying enemy forces access to designated terrain for a specific time rather than destroying the enemy outright (ADP 3-90). The *area defense* is a type of defense in which the bulk of the defending force is disposed in selected tactical localities where the decisive battle is to be fought. Principal reliance is placed on the ability of the forces in the defended localities to maintain their positions and to control the terrain between them. The reserve is used to add depth, to block, or restore the battle position by counterattack (MCRP 1-10.2). An area defense focuses on retaining terrain by positioning the bulk of a defending force in mutually supporting, prepared positions, and relying on the defenders to maintain their positions and control the terrain between them. An area defense uses battle positions and strong points in combination with obstacles and barriers to slow, canalize, and defeat the enemy attack with fires into EAs. Counterattacks are used to supplement an area defense. A *strong point* is a heavily fortified battle position tied to a natural or reinforcing obstacle to create an anchor for the defense or to deny the enemy decisive or key terrain (ADP 3-90). A *strong point* is a key point in a defensive position, usually strongly fortified and heavily armed with automatic weapons, around which other position are grouped for its protection (MCRP 1-10.2).

5-25. The area defense can be extremely effective in the jungle environment. The complex terrain, cover, and concealment provide advantages to the defender while complicating offensive operations. Troops can often accomplish maneuver along interior lines in a covered manner, increasing the defender's ability to react to enemy actions.

5-26. Commanders use the time available to improve battle positions and expand their defensive perimeter to best utilize terrain and provide flexibility. Expanding the defensive area provides commanders with the space to adjust their defensive plan to the enemy attack. More importantly, it allows commanders to trade space for time as they exhaust an attacking enemy by making that enemy fight for greater terrain. Space allows the unit to identify and develop primary, alternate, and subsequent battle positions. However, in expanding their defensive area, commanders must balance the benefits against the risk that a larger defensive area is easier to infiltrate. Larger defensive areas also disperse battle or fighting positions and can push friendly forces beyond supporting range. Leaders must take care to ensure that battle or fighting positions can provide mutual support.

5-27. The enemy attack in the jungle will likely begin with reconnaissance patrols or probing in an effort to identify the contours of the defensive area. The dense foliage requires the enemy conduct dismounted patrols to ascertain the friendly force posture. The enemy will attempt to identify gaps, weak points, obstacles, and the location of crew-served weapons. If successful, the enemy will bypass obstacles and focus the preponderance of its forces on weak points or gaps in the defense and then attempt to neutralize friendly positions one at a time. To avoid betraying the position of crew-served weapons to enemy reconnaissance patrols, machine gun teams use rifles and small arms to defend against enemy reconnaissance patrols.

5-28. The most important step in preparing an area defense is EA development. Commanders conduct a METT-TC/METT-T assessment and considers the enemy situation template to determine probable enemy

COAs and avenues of approach. Commanders then designates an EA to destroy the enemy force using massed fires from all available weapons. They may designate primary and alternate EAs to align with potential enemy COAs. Commanders next assign AOs and battle positions to subordinate units and ensure these positions are defensible and provide mutual support. Given the limited observation and fields of fire common to the jungle, battle positions will likely be closer to each other than in more open terrain. Leaders identify locations for crew-served and anti-armor weapons and emplace obstacles and mines to canalize forces into EAs. Obstacles and mines should complement natural barriers. Leaders observe all obstacles while placing them within range of direct fire weapons but outside hand-grenade range of defensive positions. Units remove excess vegetation to create clear fields of fire; however, Soldiers/Marines carefully avoid removing so much vegetation that it compromises the position's location. With the remaining time available, Soldiers/Marines conduct the priorities of work and continue to improve their defensive positions.

5-29. The seven steps of EA development:

- Identify all likely enemy avenues of approach.
- Determine likely enemy scheme of maneuver.
- Determine where to kill the enemy.
- Plan and integrate obstacles.
- Emplace weapon systems.
- Plan and integrate indirect fires.
- Rehearse the execution of operations in the EA.

5-30. After identifying the EA and battle positions, commanders can divide their defensive AO into a main battle area and a security area. They deploy security forces, establish listening and observation posts, and position early warning devices and sensors in the security area to furnish information on and disrupt the attacking enemy force. The early warning provided by security forces is critical to a successful area defense in the jungle as the dense vegetation and restrictive terrain can conceal enemy movement and reduce the time available for the commander to determine the enemy's scheme of maneuver.

5-31. Commanders plan and establish direct and indirect fire control measures as part of EA development. They designate target reference points and fire support coordination measures (FSCMs) such as final protective fires and final protective lines (FPLs) to facilitate rapidly engaging targets and providing safeguards for friendly forces. A *final protective fire* is an immediately available prearranged barrier of fire designed to impede enemy movement across defensive lines or areas (JP 3-09.3). The FPL is a selected line of fire on which friendly units check an enemy assault by interlocking fire from all available weapons and obstacles. Given the lack of identifiable terrain features in the jungle, units can establish target reference points and predetermined targets for indirect fire on streams, trail junctions, or other likely enemy avenues of approach. Units can also use indirect fire to cover dead space.

5-32. Effective command and control during an area defense requires considerable planning and rehearsals. Leaders establish near and far recognition signals to prevent fratricide between security forces and forces operating in the main battle area. Units identify lanes and establish procedures to facilitate the rearward passage of security forces from the security area upon a predetermined trigger or command.

5-33. Commanders designate a reserve to incorporate flexibility into their area defense. After the staff determines the enemy's scheme of maneuver, commanders use a reserve to concentrate combat power at the decisive point, exploit opportunities, counterattack, or support a threatened unit. Counterattacks are planned and deliberate; the counterattacking force must be aware of obstacles, mines, and lanes established in and around the EA.

MOBILE DEFENSE

5-34. The *mobile defense* is a type of defensive operation that concentrates on the destruction or defeat of the enemy through a decisive attack by a striking force (ADP 3-90). The *mobile defense* is defense of an area or position in which maneuver is used with organization of fire and utilization of terrain to seize the initiative from the enemy (MCRP 1-10.2). The mobile defense focuses on defeating or destroying an enemy by allowing enemy forces to advance to a point where they are exposed to a decisive counterattack by a striking force. The *striking force* is a dedicated counterattack force in a mobile defense constituted with the bulk of

available combat power (ADP 3-90). A fixing force supplements the striking force. Commanders use a fixing force to hold attacking enemy forces in position, to help channel attacking enemy forces into ambush areas, and to retain areas from which to launch the striking force.

5-35. A mobile defense requires an AO with considerable depth. A commander must be able to shape a battlefield/battlespace, causing an enemy force to overextend its LOCs, expose its flanks, and dissipate its combat power. Likewise, commanders must have the ability to move friendly forces around and behind an enemy force targeted for isolation and destruction.

5-36. A successful mobile defense requires the orchestration and synchronization of available capabilities across multiple domains to maximize the combat power of the defending units, particularly the striking force. Commanders orchestrate the delivery of their combined effects to regain the initiative and seize positions of relative advantage for later exploitation.

5-37. Executing a mobile defense in the jungle environment is more difficult than in other environments. The restrictive terrain, limited LOCs, and lack of mobility corridors impede the ability of a conventional mounted or dismounted striking force to outmaneuver the enemy, attack the enemy's flanks, and, ultimately, isolate and defeat the enemy. However, riverine or air assault forces can be used as a striking force in the jungle. When commanders have these forces available, they can use them to severe an enemy's LOC and isolate the attacking force. Given the sustainment challenges inherent in the jungle, the enemy's LOCs are likely to be tenuous and susceptible to attack.

RETROGRADE

5-38. The *retrograde* is a type of defensive operation that involves organized movement away from the enemy (ADP 3-90). JP 4-09 defines *retrograde* as the process for the movement of non-unit equipment and materiel from a forward location to a reset (replenishment, repair, or recapitalization) program or to another directed AO to replenish unit stocks, or to satisfy stock requirements. Marine Corps amplification of the joint definition is any movement or maneuver of a command to the rear, or away from the enemy (MCRP 1-10.2). An enemy may force these operations, or a commander may execute them voluntarily. A retrograde is a transitional operation; it is not conducted in isolation but part of a larger scheme of maneuver designed to regain the initiative and defeat the enemy. Each form of retrograde has its unique planning considerations, but considerations common to all retrogrades are risk, the need for synchronization, and security. Friendly forces conducting retrograde operations make maximum use of available enablers, such as engineers and military police, to enhance friendly mobility. This is particularly true during retrogrades in the jungle in which units need to improve route reconnaissance and construction to improve the limited LOCs. Engineers are also used to decrease the enemy's mobility by emplacing obstacles and mines. Tracked and wheeled vehicles can support retrograde operation in the jungle but often disengage first, covered by infantry. The three forms of retrograde are delay, withdraw, and retirement.

Delay

5-39. A *delay* is when a force under pressure trades space for time by slowing down the enemy's momentum and inflicting maximum damage on enemy forces without becoming decisively engaged (ADP 3-90). A *delay* is a form of retrograde in which a force under pressure trades space for time by slowing the enemy's momentum and inflicting maximum damage on the enemy without, in principle, becoming decisively engaged (MCRP 1-10.2). In delays, units yield ground to gain time while retaining flexibility and freedom of action to inflict the maximum damage on an enemy.

5-40. The delay is one of the most demanding ground combat operations. A delay wears down the enemy so that friendly forces can regain the initiative through offensive action, buy time to establish an effective defense, or determine enemy intentions as part of the performance of echelon security operations. The delaying force—normally organized into a main body, security force, and a reserve—accomplishes its mission by massing fire on the enemy in EAs and executing successive or alternate bounds to subsequent battle positions. It also attacks, defends, feints, or demonstrates. Normally in a delay, inflicting casualties on the enemy is secondary to gaining time. Except when directed to prevent enemy penetration of a phase line for a specific duration, a force conducting a delay normally does not become decisively engaged. The fixing

force in a mobile defense might also conduct a delay to draw the attacking enemy force into a location where the striking force can make a decisive attack to defeat the enemy in detail.

5-41. In the jungle, ambushes very effectively slow the enemy's pursuit and can aid the main body in breaking contact along the delay route. Reconnaissance and clearance of routes to the rear can improve friendly mobility and increase the success of a delay.

Preparing for a Delay

5-42. Preparations for a delay are similar to preparations for an area defense. The commander conducts a METT-TC/METT-T assessment and considers the enemy situation template to determine probable enemy COAs and avenues of approach. Commanders then designate a series of EAs to destroy the enemy force using massed fires from all available weapons. They then designate primary and subsequent battle positions and, if possible, strong points. Subordinate commanders designate alternate and supplementary battle positions. Given the limited observation and fields of fire common in the jungle, leaders often establish these positions closer together than in more open terrain. This ensures positions can provide mutual support and deliver maximum fire on the EA. A battle position orients on a likely enemy avenue of approach. (See paragraph 5-77 for a discussion of battle position.) A *primary position* is the position that covers the enemy's most likely avenue of approach into the area of operations (ADP 3-90). A *primary position* is a position that provides the best means to accomplish the assigned mission (MCRP 1-10.2). An *alternate position* is a defensive position that the commander assigns to a unit or weapon for occupation when the primary position becomes untenable or unsuitable for carrying out the assigned task (ADP 3-90). An *alternate position* is a position to be occupied when the primary position becomes untenable or unsuitable for carrying out its task. Its position allows fulfillment of the original task (MCRP 1-10.2). A *supplementary position* is a defensive position located within a unit's assigned area of operations that provides the best sectors of fire and defensive terrain along an avenue of approach that is not the primary avenue where the enemy is expected to attack (ADP 3-90). A *supplementary position* is a position that provides the best means to accomplish a task that cannot be accomplished from the primary or alternate position (MCRP 1-10.2). A *subsequent position* is a position that a unit expects to move to during the course of battle (ADP 3-90).

5-43. After designating battle positions, units must identify and mark routes between battle positions to enable the rapid and orderly displacement of troops. Units also identify routes and lanes between primary and supplementary positions in the event the enemy adopts an unexpected COA. Units rehearse moving between their battle positions to ensure a clear understanding of the scheme of maneuver and control measures. They also identify the location of mines and obstacles across the AO to ensure countermobility measures do not impede friendly movement. With the time remaining, forces conduct the seven steps of EA development and continue to improve their positions. (See paragraph 5-29 for discussion of the steps of EA.)

5-44. A delay is an inherently risky operation that requires using restrictive control measures to coordinate maneuver, synchronize fires, and prevent fratricide. With forces intermingling under pressure from an attacking enemy, a delay requires centralized planning and decentralized control. The commander assigning a unit to a battle position provides disengagement criteria that specify when and under what conditions the unit displaces from that position to a subsequent position. Disengagement criteria may consist of a number of enemy forces or vehicles present in the EA, a number of enemy forces or vehicles destroyed, or a set amount of time. Commanders also use trigger lines, delay lines, and disengagement lines to control movement and fires between their subordinate units. A trigger line is a phase line located on identifiable terrain that crosses the EA and is used to initiate and mass fires into an EA at a predetermined range for all or like weapon systems. A *delay line* is a phase line where the date and time before which the enemy is not allowed to cross the phase line is depicted as part of the graphic control measure (FM 3-90-1). A *disengagement line* is a phase line located on identifiable terrain that, when crossed by the enemy, signals to defending elements that it is time to displace to their next position (ADP 3-90). During jungle operations, streams or trails may be designated as trigger lines or disengagement lines; however, they must be visible from the unit's battle position. Commanders use trigger lines and disengagement lines as observable criteria for initiating and terminating actions in an EA. Trigger lines and disengagement lines, as well as disengagement criteria, are critical to decentralized control.

5-45. In addition to trigger lines and disengagement lines, delays incorporate control measures common to other defensive operations. Commanders use contact points and passage points to facilitate coordination

between adjacent units or units conducting a rearward passage of lines. Units may designate target reference points and predetermined targets to degrade or slow enemy movement along routes or in EAs. Commanders ensure their subordinate units use established common recognition signals to prevent fratricide and facilitate rearward passage of lines.

Executing a Delay

5-46. A unit executes a delay by massing fire on the enemy in a designated EA and, once disengagement conditions are met, displaces to subsequent positions and prepares to reengage the enemy. When part of the delaying force displaces to occupy subsequent positions, a remaining force maintains contact with the enemy until ordered to depart their battle position or until disengagement conditions are met. Units move between subsequent positions using either alternate or successive bounds.

5-47. A commander uses alternating bounds between battle positions when adequate forces are available and the AO has sufficient depth. When using alternating bounds, two or more units in a single AO occupy battle positions in depth. As the first unit engages the enemy, the second occupies the next position in depth and prepares to assume responsibility for the operation. The first force disengages and passes around or through the second force to occupy a subsequent position normally on a different phase line than the second force. It then prepares to reengage the enemy while the second force takes up the fight. This pattern of alternating between subsequent positions along different phase lines continues until the enemy is defeated, it withdraws, or the delay has served its purpose and the unit breaks contact. Normally commanders use alternating bounds when the delaying force operates on a narrow front. Alternating bounds offer greater security than successive bounds but require more forces and constant coordination. Alternating bounds may also require the planning and conduct of a rearward passage of lines which can slow operations.

5-48. Commanders use successive bounds when the assigned AO is so wide that available forces cannot occupy more than a single tier of battle positions along the same phase line. In a successive delay, all delaying units are committed to battle positions on the same phase line. Once disengagement conditions are met, the commander orders the staggered movement of units to subsequent positions on a different phase line. However, all units again occupy a single tier of positions on the same phase line. A successive delay has the benefit of massing all available combat power against the enemy, but it is less flexible than using alternating bounds.

5-49. Given the jungle's restrictive terrain and limited fields of fire, the commander may conduct a series of ambushes if appropriate EAs do not exist. If the commander selects this method, units reconnoiter ambush sites and routes, and rehearse actions on contact instead of conducting EA development. The location of ambush sites may vary depending on the enemy's avenue of approach. Movement between ambush sites is controlled in a manner similar to movement between subsequent battle positions. Commanders opting to conduct a series of ambushes to delay the enemy recognize that this method has more challenges for control and requires friendly forces to possess significantly greater mobility than the enemy.

Withdraw

5-50. *Withdraw* is to disengage from an enemy force and move in a direction away from the enemy (ADP 3-90). Withdrawing units, whether all or part of a committed force, voluntarily disengage from an enemy to preserve the force or release it for a new mission. Units may conduct a withdrawal under the following circumstances:

- Danger of being defeated.
- Battle under unfavorable conditions.
- Opportunity to draw the enemy into terrain or a position of relative disadvantage.
- Reposition or redeployment of the force for employment elsewhere.

5-51. Withdrawals are inherently dangerous because they involve moving units to the rear and away from what is usually a stronger enemy force. Commanders typically organize a withdrawing unit into a security force, a main body, and a reserve. Commanders also organize a detachment left in contact and stay-behind forces if the scheme of maneuver requires it. The heavier the previous fighting and the closer the contact with the enemy, the more difficult the withdrawal. Friendly forces must possess greater mobility than the attacking enemy to withdraw successfully.

5-52. The cover and concealment afforded by the jungle can aid in an effective withdrawal. Units can use this cover and concealment to improve OPSEC and move forces unobserved by the enemy. This is especially important during the initial stages of a withdrawal where functional, multifunctional, and sustainment units displace first. Units time and conduct withdrawals during conditions when they are more difficult to detect, such as at night or in periods of limited visibility. Withdrawals are enhanced by deception operations that make the enemy believe the withdrawing force is remaining in position or deceives them into believing the force is moving to a location other than their actual withdrawal objective.

5-53. Effective withdrawals require the early displacement and repositioning of enablers, such as military police and engineers, to reconnoiter withdrawal routes and improve templated assembly areas and battle positions. To aid in the movement and control of withdrawing forces, withdrawal routes and new battle positions should be marked so long as this does not jeopardize OPSEC. When withdrawing, units use stay-behind forces or security forces to maintain contact with the enemy and protect the withdrawing force by performing activities such as screens, guards, and covers. Commanders plan and employ fires to disrupt a pursuing enemy when withdrawing under pressure.

Retirement

5-54. A *retirement* is when a force out of contact moves away from the enemy (ADP 3-90). A *retirement* is an operation in which a force out of contact moves away from the enemy (MCRP 1-10.2). Retirement operations are administrative in nature. Commanders usually conduct retirement operations to reposition forces for future operations or to accommodate an updated concept of operations or scheme of maneuver.

5-55. The nonlinear nature of most jungle operations increases the risk that enemy forces will attack a retiring force. Small units and enemy patrols can infiltrate deep into friendly AOs and attack retiring forces unprepared for combat. A retiring unit organizes for combat, and commanders and staff consider security throughout the planning process. Retiring units often employ advance, flank, and rear security forces to protect the retiring force. Typically, another unit's security force provides security for a retiring unit; however, commanders must plan for enemy contact and organize the unit for self-defense when conducting a retirement in the jungle.

DEFENDING ENCIRCLED

5-56. Given the nonlinear nature of jungle operations, the jungle's restrictive terrain, and that most operations are conducted by small units operating across wide areas, encirclement of a friendly force occurs more often in the jungle than other environments. A unit may find itself encircled as a result of its offensive actions, as a detachment left in contact, when defending a strong point, when occupying a combat outpost, or when defending an isolated defensive position. The principles of defending encircled also apply to base and base cluster defense in support and consolidation areas. An encircled friendly force is either relieved by another friendly force, exfiltrates all or part of the encircled force, or breaks out and continues to attack or link up with other friendly forces.

Organization of Forces When Defending Encircled

5-57. The commander of an encircled force establishes a perimeter defense. The commander knows the specific capabilities and limitations of the different friendly units isolated in the encirclement. Therefore, the commander designs the defense to maximize the capabilities of available forces. Forward units establish mutually supporting positions around the perimeter and in depth along principal avenues of approach. Units occupy the best available defensive terrain. Commanders may attack to seize key or decisive terrain so that it is incorporated into the perimeter defense. Once the commander assigns defensive AOs and battle positions, the preparations are the same as in the area defense. Encircled units make their defensive positions as strong as possible, given time and resource constraints. The commander anticipates that the enemy will attempt to split the defenses of the encircled force and defeat it in detail.

5-58. The encircled force commander establishes a reserve that is mobile enough to react quickly to events anywhere along the perimeter. The encircled commander centrally positions this reserve to take advantage of interior lines with operations diverging from a central point. The use of interior lines provides flexibility and enables the encircled commander to respond rapidly to enemy attacks at any point along the perimeter.

If only dismounted forces are available, the encircled commander establishes small local reserves positioned at key points around the perimeter to react to potential threats. The encircled commander organizes a mobile anti-armor element from the best available anti-armor systems. If possible, subordinate units also retain their own reserves.

BREAKOUT FROM AN ENCIRCLEMENT

5-59. A *breakout* is an operation conducted by an encircled force to regain freedom of movement or contact with friendly units (ADP 3-90). It differs from other attacks only in that a simultaneous defense in other areas of the perimeter must be maintained (MCRP 1-10.2). After breaking out, an encircled commander can either continue to attack deeper into enemy territory or link up with other friendly forces. An encircled force normally attempts to conduct breakout operations when one of the following four conditions exist:

- The senior commander directs the breakout or the breakout falls within the intent of a higher echelon commander.
- The encircled force lacks sufficient relative combat power to defend itself against enemy forces attempting to reduce the encirclement.
- The encircled force lacks adequate terrain to conduct its defense.
- The encircled force cannot sustain itself long enough to be relieved by forces outside the encirclement.

ATTACKING DEEPER INTO ENEMY TERRITORY

5-60. A COA that an enemy does not expect from an encircled force is to attack deeper into enemy territory to seize key terrain. This type of attack involves great risk, but it may offer the only feasible COA under some circumstances. Attacking may allow an encircled unit to move to a location where it can be extracted by other ground, naval, or air forces. Attacking deeper is only feasible if a unit can sustain itself while isolated, although some of that sustainment can come from aerial resupply and enemy supply stocks.

EXFILTRATION

5-61. *Exfiltrate* is a tactical mission task where a commander removes Soldiers or units from areas under enemy control by stealth, deception, surprise, or clandestine means (FM 3-90-1). If the success of a breakout appears questionable, or if it fails and a relief operation is not planned, one way to preserve a portion of the force uses organized exfiltration. Commanders can effectively exfiltrate all or part of an encircled force during jungle operations since the restrictive terrain and cover and concealment provided by the foliage enable penetrating enemy lines undetected. Exfiltrations are best conducted during periods of darkness or limited visibility and use control measures similar to an infiltration. Commanders designate exfiltration lanes and rally points to organize the movement of small units. If possible, linkup points are established with other friendly forces. Commanders implement restrictive fire or no-fire areas to prevent fratricide.

5-62. Deception operations enhance the effectiveness of an exfiltration. Commanders plan a deception operation to divert the enemy's attention away from the planned exfiltration lanes or linkup points. Deception operations deceive the enemy into believing that the encircled force remains encircled and that attempts to breakout or exfiltrate have failed. The risks weighed for deception operations during an exfiltration involve requiring some of the encircled force to stay behind.

FORMS OF THE DEFENSE/DEFENSIVE METHODS

5-63. There are three forms of the defense – perimeter, linear, and reverse slope. The Marine Corps identifies an additional three defensive methods: battle position, strong point, and sector. Commanders can employ these basic dispositions to array forces in a defense relative to the terrain and enemy in the jungle environment.

PERIMETER

5-64. A perimeter defense is oriented in all directions. A perimeter defense may be in any number of shapes. A successful perimeter defense requires aggressive patrolling and security operations outside the perimeter.

The commander establishes a perimeter when the unit must hold critical terrain, such as a strong point, or when it must defend itself in areas where the defense is not tied in with adjacent units. In the jungle, leaders commonly use perimeter defenses to secure fire bases. Advantages include—

- 360-degree security.
- Centralized control.
- Quick emplacement, and it can be executed by any size unit.
- The frontage of the perimeter can be easily adjusted and reinforced.
- It is mutually supported by observation, communications, and easily coordinated patrols.
- Interior lines provide flexibility and allow the commander to shift forces rapidly where needed on the perimeter.

5-65. Disadvantages include—

- Any penetration creates problems of enfilade, masking, and cross fires.
- It is difficult to achieve final protective fires with crew-served weapons.
- Because of the circular configuration, the unit is vulnerable to the entire effects of the bursting radius of an indirect fire weapon.

5-66. Perimeter defense is the most common form of defense/defensive method used in the jungle. Due to the thick foliage common in the jungle, the commander may reduce the size of the perimeter defense by positioning subordinate units closer together to account for reduced fields of fire and ensure mutual support. Perimeters vary in shape depending on the terrain and situation including, but not limited to, a triangle, a circle, an elongated oval, or a Y. The perimeter shape conforms to the terrain features that best capitalize on friendly observation and fields of fire.

5-67. To establish a perimeter defense, commanders first place crew-served weapons where they have the best fields of fire. They then position the rest of the unit in mutually supporting fighting positions. As soon as possible, the unit establishes observation posts, listening posts, dismounted patrols, and other local security measures. Soldiers/Marines emplace mines and obstacles. The commander plans and coordinates FSCMs such as target reference points, predetermined targets, final protective fires, and FPL. If time is available, Soldiers/Marines prepare alternate fighting positions to expand and contract the perimeter. Commanders may contract the perimeter at night to guard against enemy infiltration. Indirect fires are registered, and Soldiers/Marines continue with priorities of work. (For more information on preparing a perimeter defense, see ATP 3-21.8.)

5-68. If units have tanks and fighting vehicles available, the commander adjusts the perimeter defense to integrate dismounted and mounted troops in a complementary manner. Despite their firepower and protection, the limited observation and fields of fire in the jungle make armored vehicles vulnerable to attack by dismounted forces. Commanders position tanks and fighting vehicles further back in the perimeter defense and, if possible, in fighting positions at hull or turret defilade. If natural conditions do not exist for hull or turret defilade positions, and engineer support is available, troops construct parapets to protect against antitanks weapons. If time is available, fighting vehicle and tank crews prepare alternate positions for their vehicles. Alternate positions allow vehicles to move between positions after firing their main gun to prevent the enemy from accurately targeting the vehicles. Units camouflage fighting vehicles with netting or other available materials. Soldiers/Marines prepare individual fighting positions in front of vehicles and erect pre-detonation screen material to provide stand-off against enemy use of rocket-propelled grenades and antitank guided missiles.

5-69. An enemy attack against a perimeter defense may be a surprise assault or be preceded by preparatory fires. The unit should maintain all heavy weapons manned and ready to fire, but Soldiers/Marines ensure patrols and observation posts have returned within the perimeter before firing FPL. Moving tracked and wheeled vehicles during a night attack on a defensive position can be exceedingly dangerous to the vehicles as well as other Soldiers/Marines.

5-70. The Y-shaped perimeter defense is a variation of the perimeter defense that units can implement when the terrain is not conducive to deploying forces in a circular manner. Although it may not appear to be a perimeter defense, the Y-shaped defense effectively repels an enemy attack from any direction. The Y-shaped perimeter defense is usually employed at the platoon or company level. The Y-shaped defense provides

360-degree fires by assigning Soldiers/Marines supplementary fighting positions that cover fields of fire to the rear of their primary fighting positions (see figure 5-1). As such, commanders designate and prepare multiple EAs for units conducting a Y-shaped defense. Determining which EA to utilize requires active security measures. Commanders must plan for additional observation posts and patrols. The Y-shaped perimeter defense proves particularly useful in mountainous jungles where thick foliage and terrain limit observation and fields of fire. (See ATP 3-21.8 for more information on the Y-shaped defense.)

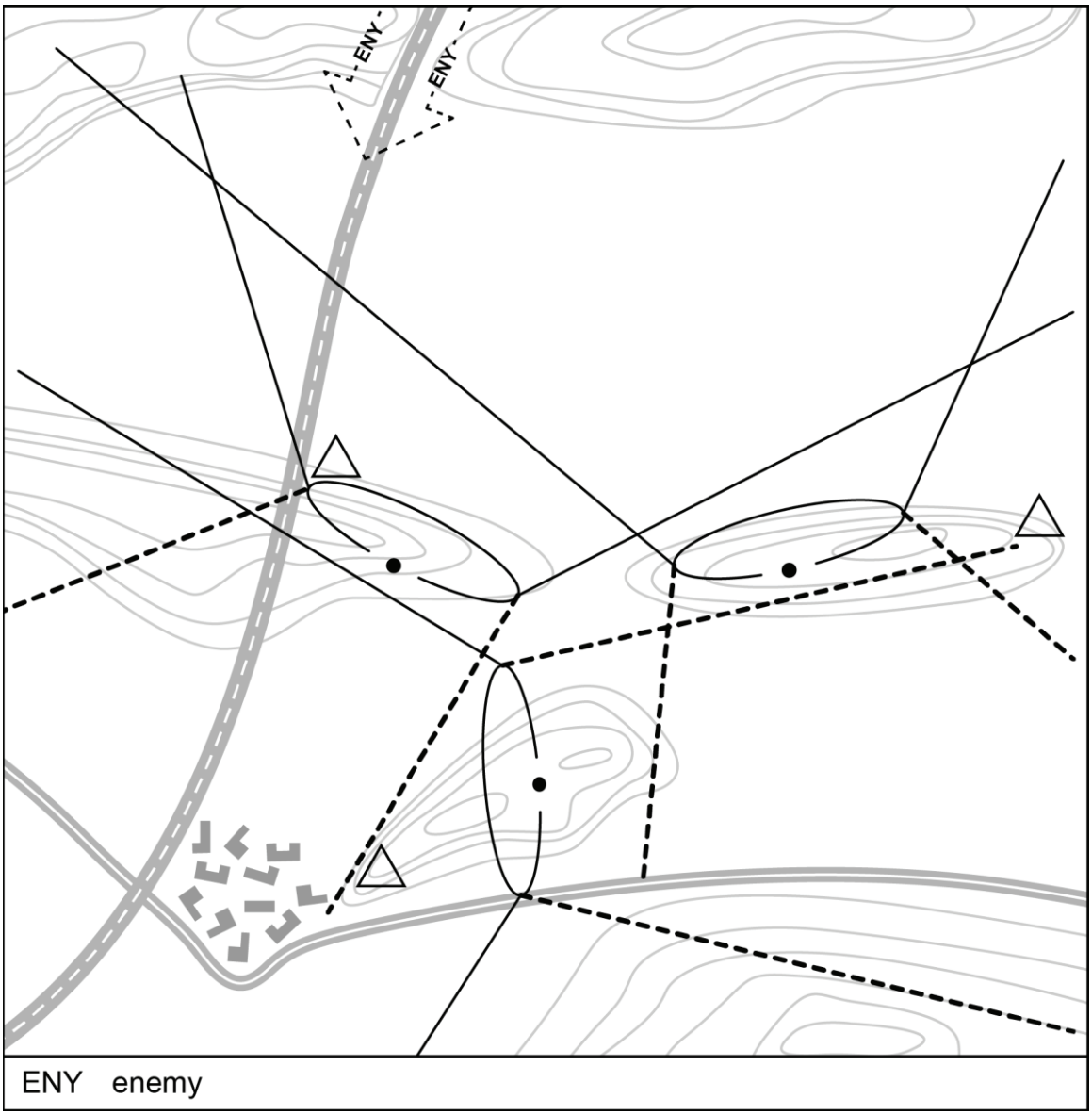


Figure 5-1. Y-shaped perimeter defense

5-71. The Y-shaped perimeter defense requires restrictive fire control measures to prevent fratricide. Leaders ensure the limits of fire for each weapon system and position do not fire into adjacent unit's positions. When planning a Y-shaped defense, commanders incorporate terrain and elevation to their advantage and preferably array their defense to fire downward into EAs. Additional considerations for the Y-shaped defense include:

- Positioning crew-served weapons near the apex of the "Y" to allow an FPL that covers the unit's frontage while firing away from the adjacent unit's position.
- Identifying fighting positions most at risk to friendly fire and preparing those positions to protect Soldiers/Marines from fire from those directions.
- Executing a Y-shaped defense like an ambush by allowing the enemy to penetrate well into the EA before attacking.

LINEAR

5-72. A commander may conduct either an area or mobile defense along or behind a linear obstacle. Normally commanders prefer an area defense because it accepts less risk by not allowing the enemy to cross the obstacle. Linear obstacles such as mountain ranges, large areas of impassable terrain, or waterways generally favor a forward defense. The defending force seeks to defeat any enemy attempt to seize a bridgehead across the linear obstacle. Local defending units immediately and violently counterattack any enemy bridgeheads to destroy enemy forces located on the bridgehead while higher echelons attempt to isolate enemy bridgehead sites. If the enemy seizes a bridgehead and strikes out rapidly, it could quickly penetrate the defending force. This requires the commander to conduct either a delay or a withdrawal.

5-73. Deploying in strength along the entire length of a linear obstacle is difficult. The defending commander must conduct economy of force measures in some areas. Within an area defense, the commander's use of a defense in depth accepts the risk that the enemy may force a crossing at a given point. The depth of the defense should prevent the enemy from rapidly exploiting its success. However, the mobility challenges associated with the jungle make it difficult for commanders to rapidly reinforce areas where the enemy has crossed the linear obstacle. To be successful, a linear defense in the jungle requires accurate intelligence for positioning forces and constructing a defense that enables reinforcement at the point where the enemy is most likely to cross the linear obstacle. Otherwise, enemy air or indirect fire can easily target units using improved roads to maneuver between areas.

5-74. The mobile defense gives the enemy an opportunity to cross the obstacle with a portion of the attacking enemy force. The commander conducting a mobile defense along a linear obstacle normally employs minimal forces along the obstacle as the fixing force and entices the enemy to cross at the defending force's desired location. Once the enemy has partially crossed the obstacle and divided its forces, the commander conducts shaping operations to isolate the enemy bridgehead. Once the bridgehead is isolated, the defending commander launches a decisive attack by the striking force to destroy the isolated enemy bridgehead. As in the area defense of a linear obstacle, mobility challenges associated with the jungle make it difficult for the commander to rapidly maneuver a striking force. To mitigate this, a commander conducting a mobile defense of a linear obstacle in the jungle must position the striking force in a location where it can rapidly access the enemy point of penetration and defeat the bridgehead. The commander also conducts deception operations to entice the enemy to cross at a location within desired range of the striking force.

REVERSE SLOPE DEFENSE

5-75. The commander organizes a reverse slope defense (illustrated in figure 5-2) on the portion of a terrain feature or slope with a topographical crest that masks the main defensive positions from enemy observation and direct fire. All or part of the defending force may employ this technique. It is generally useful at lower tactical levels, such as battalion and below.

5-76. Using the reverse slope defense has limited value in the jungle environment. Concealment is excellent in the jungle rendering the denial of enemy observation afforded by terrain of lesser importance. The natural concealment offered by the jungle often reduces visibility more than the topographical relief. However, in jungles where concealment is reduced by forestry or agricultural practices, or the height of the natural vegetation is less than equipment, the reverse slope defense can be incredibly effective.

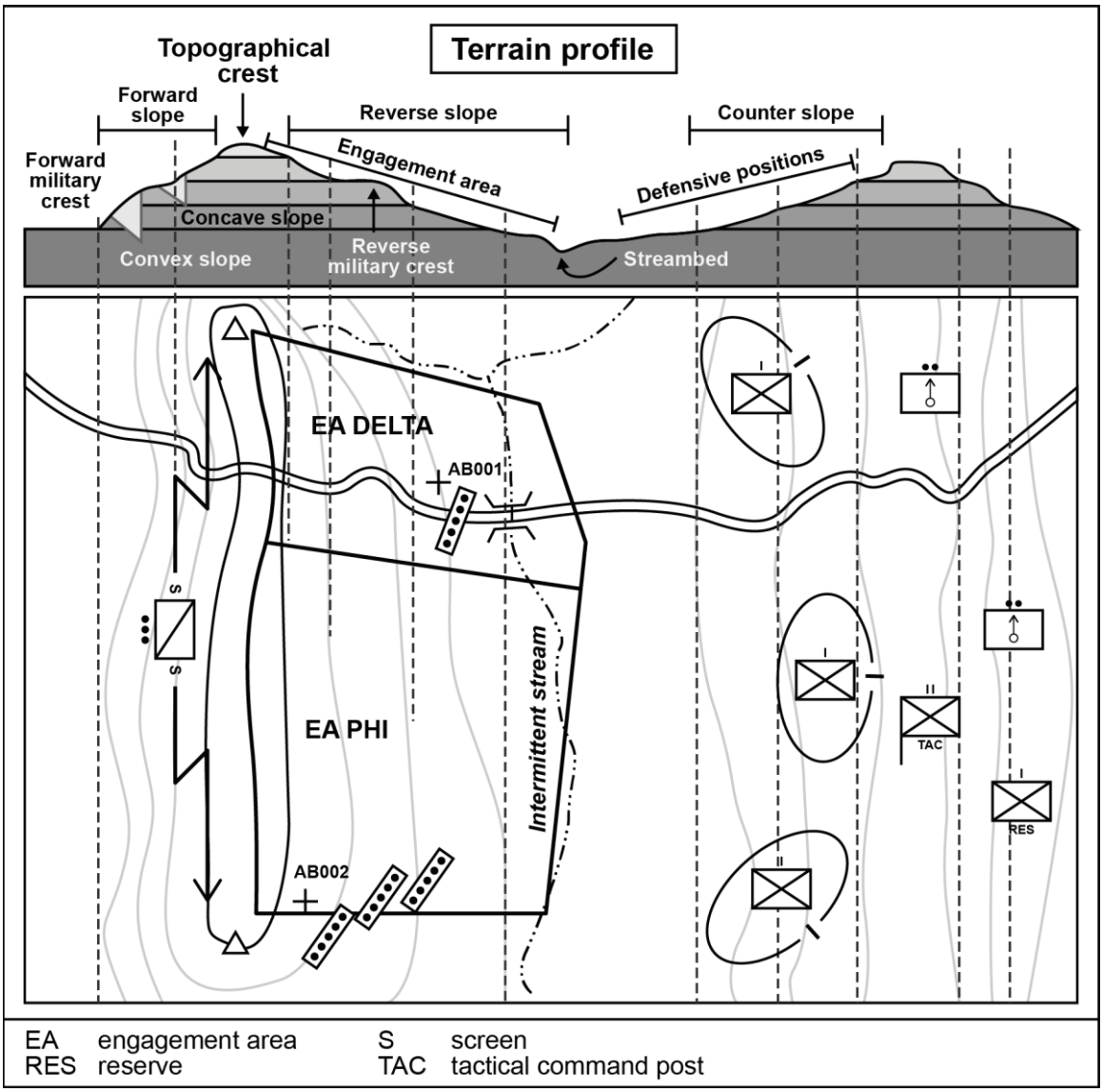


Figure 5-2. Reverse slope defense

BATTLE POSITIONS

5-77. In ground operations, a *battle position* is a defensive location oriented on an enemy avenue of approach from which a unit may defend (MCRP 1-10.2). A battle position aims to deny or delay the enemy the use of certain terrain or an avenue of approach. The size of a battle position can vary with the size of the unit assigned. For ground combat units, battle positions are usually hastily occupied, but should be continuously improved. (See MCWP 3-01 for a discussion of battle positions.)

STRONG POINT

5-78. A *strong point* is a key point in a defensive position, usually strongly fortified and heavily armed with automatic weapons, around which other positions are grouped for its protection (MCRP 1-10.2). Usually heavily fortified and armed with automatic weapons, it is designed to deny the enemy certain terrain and the use of an avenue of approach. It differs from a battle position in that it is designed to be occupied for an extended period. Units establish a strong point on critical terrain and hold it for the defense to succeed. A

strong point requires all-around defense and should have sufficient supplies and ammunition to continue to fight even if surrounded or cut off from resupply. Strong points often require considerable time and engineer resources to develop. (See MCWP 3-01 for a discussion of strong point.)

SECTOR

5-79. A commander may assign subordinate commanders defensive sectors to provide them maximum latitude to accomplish assigned tasks. The extent of the assigned sector assigned depends on the METT-T but as a general rule should be no larger than can be influenced by the unit. (See MCWP 3-01 for a discussion of sector.) The jungle's restricted terrain and dense vegetation limit observation and fields of fire. Such limitations may require assigning smaller sectors to subordinate units. It may also require commanders placing mutually supporting sectors closer together.

TRANSITION

5-80. Defending commanders anticipate the success of their defense and transitions to the offense. If a defense fails, defending commanders transition into retrograde operations. Transition from one type of operation or task/operation to another requires mental as well as physical agility from the involved formations and an accurate understanding of the situation.

TRANSITION TO OFFENSE

5-81. A defending commander transitions to the offense by anticipating when and where an enemy force will reach its culminating point or require an operational pause before it can continue. At those moments the combat power ratios most favor the defending force. An enemy force will do everything it can to keep a friendly force from knowing when it is overextended. Indicators that an enemy force is becoming overextended include—

- Enemy forces begin to transition to the defense.
- Enemy forces suffer heavy losses.
- Enemy forces start to deploy before encountering friendly forces.
- Enemy forces are defeated in most engagements.
- Enemy forces are committed piecemeal in continued attacks.
- Enemy reserve forces are identified among attacking forces.
- Examination of captured or killed enemy soldiers and captured or destroyed enemy equipment and supplies shows that the enemy cannot adequately sustain itself.
- Enemy forces have a noticeable reduction in their tempo of operations.
- Local counterattacks meet with unexpected success.

5-82. In a mobile defense, transitioning to an offense generally follows a striking force's attack. In an area defense, commanders designate a portion of their force to conduct the counterattack, selecting units based on the concept of operations. Commanders often allocate available reserves to this counterattack effort.

TRANSITION TO THE RETROGRADE

5-83. A retrograde usually involves a combination of delay, withdraw, and retirement operations. These operations may occur simultaneously or sequentially. As in other operations, the commander's concept of operations and intent drive planning for a retrograde. Each form of retrograde has its unique planning considerations, but considerations common to all retrogrades are risk, the need for synchronization, and security. However, several key considerations receive special emphasis during the transition from the defense to the retrograde. For example, the transition to a retrograde must be accompanied by efforts designed to—

- Reduce an enemy force's strength and combat power.
- Provide friendly reinforcements.
- Concentrate forces elsewhere for the attack.
- Prepare stronger defenses elsewhere within an AO.
- Lure or force part or all of an enemy force into areas where it can be counterattacked.

5-84. The nature of a retrograde involves an inherent risk of degrading a defending force's morale. Therefore, maintaining offensive spirit is essential among subordinate leaders and Soldiers. Rearward movements may be seen as a defeat or as an action that could result in isolation of the force. Commanders must be well forward and visible. Commanders ensure that subordinate leaders and Soldiers/Marines understand the purpose and intent of the retrograde and their role in accomplishing the mission. Thorough planning, effective control, and aggressive leadership minimize risk during a retrograde and enhance its probability of success.

WARFIGHTING FUNCTION CONSIDERATIONS

5-85. Commanders execute an effective defense by synchronizing the warfighting functions to leverage maximum combat power across multiple domains at decisive points. However, the jungle's terrain and environment affect warfighting functions differently, and commanders must plan and adjust operations to account for these effects. The following considerations, organized by warfighting function, apply to defensive operations in the jungle.

INFORMATION

5-86. Information operations in the defense consist of MILDEC and OPSEC measures used to protect friendly forces. Units can use MILDEC to degrade or neutralize enemy information operations. Commanders can employ OPSEC to deny the enemy knowledge about the size, capabilities, location, disposition, and intent of friendly forces. Units use the OPSEC process to protect the commander's concept of operations and prevent the enemy from identifying potential vulnerabilities.

COMMAND AND CONTROL

5-87. A defensive mission generally imposes few restrictions on a defending commander. It allows freedom of maneuver within assigned boundaries, but it requires commanders to prevent enemy penetration of their rear boundary. This mission allows commanders to distribute forces to suit the terrain and plan EAs that integrate direct and indirect fires. The defensive plan must address the transition to the offense, retrograde, or consolidation of gains. Commanders may require additional signal support—such as retransmission teams, joint network node signal assets, satellite communications, and tactical radio communications—to facilitate command and control across defensive frontages in complex terrain with limited visibility between defensive positions.

5-88. Because an enemy force has the initiative, the defending commander may have to frequently shift main and supporting efforts within the unit's shaping operations to contain the enemy's attack until the defending force can seize the initiative. Rapidly shifting the priority for support and reinforcement during a defense in the jungle is complicated by the lack of LOCs and restrictive terrain. Movements are slower and the supply system is less responsive; therefore, commanders may consider caching or prepositioning supplies at various locations across the AO to better facilitate shifts between the main and supporting efforts. Commanders carefully position the reserve or striking force in a location where it can respond rapidly to the enemy's attack and support the decisive operation.

5-89. Because command posts and communications nodes tend to be relatively static in the defense, commanders place them in hardened areas or protective terrain and reduce their electronic and visual signatures. Command posts remain capable of rapidly relocating in response to battlefield developments.

5-90. The following additional factors should be considered when planning for the jungle defense:

- Day and night in jungle regions are each 12 hours long. Nights, especially under jungle canopies, are extremely dark. Units begin defensive preparations at least 2 hours before night fall.
- Tropical rain will flood positions unless they have adequate drainage. During the rainy season, units dig defensive positions on high ground, if possible.
- Because jungle terrain favors infiltration, the use of NVDs, IR devices, observation posts, listening posts, and early warning devices is critical.

MOVEMENT AND MANEUVER/MANEUVER

5-91. Defending commanders exploit the advantages of occupying the terrain in a jungle environment where an engagement will occur. Defending commanders select terrain that allows the massing of friendly fires. Defensive positions in the main battle area make use of existing and reinforcing obstacles that impede enemy movement forcing the enemy to commit forces piecemeal into friendly EAs. This exposes portions of an enemy force for destruction without giving up the advantages of fighting from protected positions. Examples of key terrain include major obstacles (natural and manmade) that units can cover by fires, important road junctions, and choke points that impact troop movements.

5-92. Commanders perform security operations in the jungle environment to provide their protected forces time, space, and intelligence necessary to react to the approach of enemy forces while simultaneously forcing the enemy to deploy prematurely. Commanders perform security operations to conceal the location of their main battle positions, prevent enemy observation of friendly preparations and positions, and keep the enemy force from delivering observed fire on these positions. Given the restrictive terrain and the lack of LOCs in the jungle, the security area may be shallower than in other environments. This consideration accounts for the additional time necessary for security forces to execute a rearward passage of lines after they have screened the attacking enemy. The security forces are likely dismounted, and, without adequate LOCs, these forces need additional time to withdraw to the main battle area.

5-93. While dismounted forces execute the preponderance of defensive operations in the jungle, armored vehicles can enhance defensive firepower. In battle positions and strong points, armored vehicles are positioned to—

- Capitalize on the maximum effective range of their weapon systems.
- Block possible armor or motorized penetrations.
- Move quickly to fill gaps in the defense.
- Incorporate anti-armor and heavy, direct fire weapons into the defensive plan.

Mobility

5-94. During a defense, mobility tasks include maintaining routes, coordinating gaps in existing obstacles, and supporting counterattacks; engineer units typically perform these tasks. Commanders establish the priority of mobility support based on the mission variables. This support consists mainly of reducing obstacles and improving or constructing combat roads and trails to allow tactical support vehicles to accompany combat vehicles. Enemy fires and friendly use accelerate the normal wear on routes. During a counterattack, engineer breaching systems open closed lanes or breach hasty minefields placed by a retrograding enemy. Commanders coordinate carefully to ensure that units leave lanes or gaps in their obstacles that allow for the repositioning of main body units and the commitment of the counterattacking force. CBRN reconnaissance systems also contribute to a force's mobility in a contaminated environment.

Countermobility

5-95. During a defense, units conduct countermobility operations to reduce the enemy's mobility through the use of obstacle zones, belts, barriers, and groups. When planning obstacles, commanders and staffs consider not only current operations, but also future operations so they do not hinder counterattacks. Troops must clearly mark and report minefields to avoid unnecessary losses if friendly forces later maneuver over the area. Units use obstacles to disrupt enemy maneuver, upset the enemy's tempo, and maximize the effectiveness of direct and indirect fire by fixing the enemy in EAs.

5-96. Countermobility requirements in the jungle are less intensive than in other environments. If effectively incorporated into the defense, the jungle's restrictive terrain serves as a natural obstacle to block, fix, or canalize enemy forces. This negates the requirement for extensive engineer support to emplace obstacles. Additionally, the lack of LOCs makes transporting Class IV material difficult and often counterproductive. Finally, commanders who emplace manmade obstacles in the jungle must ensure that obstacles do not betray the location of friendly forces. Obstacle emplacement in the jungle can upset the concealment provided by natural foliage and indicate the presence of friendly forces.

Obscuration in the Defense

5-97. Commanders use obscurants in a jungle defense to disrupt an enemy's assault or movement formations, prevent the use of target acquisition optics, complicate visual navigation, and deny air avenues of approach, landing zones, and drop zones. Obscurants create gaps in enemy formations, mark targets, and screen and obscure friendly positions to deny the enemy information about the size, location, and composition of friendly defensive positions. Units also use obscurants to enhance MILDEC operations and conceal the movement of friendly forces. Modern bi-spectral obscurants provide protection from thermal as well as visual spectrum viewing devices. Commanders carefully employ obscurants only after considering enemy systems and friendly capabilities. Improper use can create an advantage for an enemy by betraying the location of friendly forces and limiting friendly observation and fields of fire. The effectiveness of obscurants depends on weather conditions and the rate and quantity of obscurants employed.

5-98. An attacking enemy force can be expected to create or take advantage of limited visibility conditions and obscuration. Normally, a defending commander can expect an attacker taking advantage of these conditions to—

- Conduct reconnaissance to locate a defender's strong points, obstacles, and positions under the cover of darkness, well in advance of the planned attack, such as the night prior.
- Attack during periods of limited visibility similar to those occurring during the reconnaissance.
- Bypass defensive obstacles.
- Infiltrate through gaps in a defender's coverage caused by reduced observation and fields of fire.

INTELLIGENCE

5-99. When planning defensive operations, commanders use intelligence products to identify probable enemy objectives and approaches in the jungle. From those probable objectives and approaches, intelligence staff can develop named areas of interest and target areas of interest. In a defense, IPB attempts to determine the enemy's strength, disposition, objectives, COAs, and the location of follow-on forces. IPB products also identify cyberspace activities; cross-domain capabilities; patterns of enemy operations; and the enemy's vulnerability to counterattack, interdiction, EW, air attacks, and canalization by obstacles. Commanders study an enemy force's capability to conduct air attacks against friendly forces, insert forces behind friendly units, employ CBRN weapons or weapons of mass destruction, and conduct unconventional warfare. The intelligence staff also evaluates how soon enemy follow-on forces can be committed. Defending commanders can then decide where to arrange their forces to defend and shape the battlefield.

FIRES

5-100. The targeting process ensures the collective and coordinated use of indirect and joint fires to gain and maintain fire superiority throughout defensive operations. In the defense, commanders use fires to neutralize, suppress, or destroy enemy forces. Commanders also employ fires to delay or disrupt an enemy's ability to execute a given COA and to enhance the effects of massed direct fires.

5-101. Commanders employ fires to support their security forces during jungle operations, to destroy enemy reconnaissance elements, and against other high-payoff targets. Commanders support security forces by planning the delivery of fires at appropriate times and places to slow and canalize an enemy force as it approaches and moves through the friendly security area. This support allows their security forces to engage enemy forces on more favorable terms. Finally, commanders use fires to support the withdrawal of security forces on completion of their shaping efforts and when a defending unit is prepared to conduct main battle area operations. Organic and joint fires continue to engage enemy follow-on forces before they can be committed to the main battle area. Fire support assets engage enemy command and control facilities and logistics sites in depth to isolate an attacking enemy.

Field Artillery

5-102. Commanders recognize that during an area defense or a retrograde, repositioning assets between position areas for artillery (PAAs) takes effort and intense resources after careful planning to ensure success. The jungle's restrictive terrain and limited LOCs make ground movement slow and arduous for artillery units.

If available, commanders use aviation assets to move artillery by sling load between PAAs. Movement between PAAs in a jungle require earlier initiation and more time than during operations in open terrain.

5-103. When planning and siting PAAs, commanders resist the urge to co-locate PAAs with headquarters or at sustainment bases. The challenges associated with clearing foliage to establish PAAs can lead inexperienced units to concentrate assets in a single location. However, the significant electromagnetic signature produced by artillery, EW, and their supporting assets make them vulnerable to enemy detection and counterfire. This places the co-located units and assets at greater risk and potentially makes the site a high-value target for the enemy. To prevent this, commanders identify and clear PAAs as part of their defensive preparations and ensure to disperse forces in a manner that mitigates risk.

5-104. Mutual support in jungle operations is both a factor of time (supporting distance) and weapon range (supporting range) due to the large areas units cover and the impacts of terrain relief and vegetation height and density. Commanders sometimes have to accept gaps in initial positions between and within task forces. Ideally, a leader arrange units by siting defending forces in such a manner that forces in at least two positions can engage an enemy maneuvering on any one of them. This greatly reduces any possibility of defeat in detail. When gaps exist, troops vigilantly keep them under surveillance. The defensive plan must include provisions for maneuvering to fire on any part of a gap before the enemy can move through it. A higher headquarters defines the unit's AO and so the unit can clearly identify it on the ground.

5-105. Staffs plan defensive targets for artillery and mortars on stream and trail junctions as well as any other likely enemy avenues of approach. Units use artillery and mortar fire to cover the many areas of dead space found in jungle terrain. When preparing the defense, staffs confirm preplanned targets using artillery-marking missions integrated into registration missions. Signals for employing CAS, attack aviation, call for fire (both day and night), medical evacuation, and aerial resupply must be planned.

Air and Missile Defense

5-106. Ground commanders mitigate the risk of air and missile attack with various activities in the jungle environment. These activities include camouflage, concealment, deception, dispersion, redundancy, detection and warning, and protective construction. These activities improve unit survivability by reducing the likelihood of being detected and targeted from the air and by mitigating the potential effects of air surveillance and attack. Mitigation activities include detecting air and missile launches, predicting impact points, conducting rapid threat identification, and disseminating early warning.

SUSTAINMENT/LOGISTICS

5-107. Commanders address several unique sustainment considerations in the jungle defensive plan. Priorities for jungle replenishment are normally ammunition and materiel to construct obstacles and defensive positions. Usually units reduce their need for bulk fuel. Some units have an increased demand for decontaminants and CBRN collective and personal protective equipment. The supply of obstacle materials in a defense can create problems that require detailed coordination and long lead times. Commanders consider the transportation and personnel required to obtain, move, and emplace barrier material and obstacles.

5-108. Due to the challenges associated with moving supplies in restrictive jungle terrain, commanders consider stockpiling or caching ammunition and limited amounts of petroleum products throughout their AO when conducting a defense. These TTP can be especially effective during a retrograde when units will displace to planned positions under friendly control. However, commanders make plans to destroy these stocks if necessary as part of denial operations. Commanders also consider that the absence of infrastructure and LOCs in many jungles can make it difficult to find suitable locations to stockpile munitions and supplies in a manner that protects them from environmental degradation.

5-109. Commanders direct sustainment/logistics operators to deliver combat-configured loads to their maneuver units regularly. Combat-configured loads are typically packages of potable and nonpotable water, barrier materials, ammunition, medical supplies, and repair parts tailored to a specific-sized unit. Configured loads eliminate the need to request supplies and reduces the chance that a lapse in communications will interrupt the supply flow and jeopardize the integrity of a defense. Commanders use information systems to accurately tailor these combat-configured push packages to the demands of supported maneuver units.

PROTECTION

5-110. In a jungle defense, commanders protect forces and critical assets by synchronizing, integrating, and organizing protection capabilities and resources. Commanders incorporate protection as they understand and visualize threats and hazards in an operational environment and the protection capabilities available. Commanders then apply the elements of combat power to prevent or mitigate these threats or hazards from negatively impacting friendly operations. Commanders use decision support tools and analysis to assess a unit's critical assets and key vulnerabilities.

5-111. Commanders take measures to protect against and defeat enemy conventional and unconventional attacks throughout the depth of their AO. This is especially important in the rear area where unsuspecting units may be more vulnerable to attack and the density of high-value targets is likely greater. The rear area's purpose is to generate and maintain combat power for the commander in the close and deep fights. The success of a defensive operation may rest on combat power provided by the rear area to conduct a counterattack. As such, commanders take steps to protect against conventional and unconventional threats in the rear area. Commanders designate a tactical combat force to defeat Level II and Level III threats, and conduct survivability operations to enhance the rear area's ability to withstand air and missile attacks.

5-112. Because of the risk of infiltration, commanders employ security forces and physical security measures to prevent and defeat unconventional threats in the rear area. Guerrillas, saboteurs, or enemy airborne or air assault forces often target sustainment bases, command and control sites, or other critical assets in the rear area. These attacks often precede or are conducted in conjunction with large-scale offensive operations in the deep or close area. Physical security measures can deter and disrupt but not defeat unconventional threats. Physical security measures include access control procedures, physical barriers, and the use of lighting or other measures that make it difficult for unconventional forces to access critical sites. To best protect critical sites and assets, commanders employ both physical security measures and security forces. Commanders use military police and other security forces, in addition to the tactical combat force, to complement physical security measures and defeat unconventional attacks in the rear area.

Survivability Operations

5-113. Since an attacking enemy force usually has the initiative in terms of where and when it will attack, a defending commander must take a wide range of actions to reduce the risk of losses. To avoid detection and destruction by the enemy, units move frequently and quickly establish survivability positions. To provide flexibility, units may need primary, alternate, and supplementary positions. This particularly applies with units defending key or decisive terrain. Units enhance their survivability by using concealment, MILDEC, decoy or dummy positions, dispersion, and field fortifications.

5-114. The effective defender exploits every advantage the jungle environment provides, particularly the cover and concealment provided by the foliage and restrictive terrain. A force that remains concealed enhances its survivability and can disrupt an enemy's attack by using surprise fire from undetected locations. Though not as common as in other types of terrain, units incorporate features that lend themselves to the defense—such as rivers, gorges, and ridges—and enhance survivability. The defender incorporates defensive characteristics of the jungle terrain and environment.

5-115. Leaders ensure that troops in the defense do not become complacent and stay adequately prepared for an attack whenever it may occur. Staffs establish alert systems to ensure constant security operations. Although the poor observation in jungles favors an attack at any time, the early hours of the morning afford the attacker the greatest chance of surprise unless active security and reconnaissance measures exist. Such measures include active patrolling, the use of early warning systems, and manned observation posts overwatching potential enemy avenues of approach.

CBRN Defense

5-116. Because defending units often remain in fixed positions, they increase their vulnerability to CBRN threats and hazards. Commanders specify the degree of acceptable risk and establish priorities for CBRN assets. Patrols identify local sources of water, and staffs develop plans to use these resources to conduct decontamination operations if necessary.

Security

5-117. Since enemy tactics, jungle terrain, and bad weather favor attacks conducted with stealth, security stands as the leader's first concern. Observation posts, listening posts, early warning devices, ambushes, and patrols are all measures that will prevent a unit from being surprised. Leaders plan patrols according to an irregular schedule. Marines use a system of recognition signals to prevent the engagement of friendly units. All units provide their own local security. Terrain, communications, target acquisition capabilities, and the enemy threat determine the depth of local security. (See MCTP 3-01A [MCWP 3-11.3] for a discussion of security.)

Passive Security Measures

5-118. All units employ passive security measures to reduce exposure to the enemy. These measures include observation, electronic exposure, and fires. Units strictly enforce communications procedures, camouflage, movement control, and other individual continuing actions. (See MCTP 3-01A [MCWP 3-11.3] for a discussion of passive security measures.)

5-119. To counter enemy reconnaissance efforts, units should shift the positions of machineguns after dark. After a few days, commanders change the entire unit's position. If a unit remains in position for a longer period, the enemy can more likely reconnoiter it and attack.

Active Security Measures

5-120. Active security measures include combat patrolling, sensors, target acquisition radars, surveillance, and employment of false visual and electronic signatures. In addition, capability sets of certain units enhance the security posture of the organization. For example, engineers contribute to survivability, mobility, and countermobility—all of which contribute to security. (See MCTP 3-01A [MCWP 3-11.3] for a discussion active security measures.)

Conduct Population and Resources Control

5-121. Commanders plan for dislocated civilians and the effect they have on friendly defensive operations. Civil affairs and military police assist commanders in planning PRC measures. A defending unit uses HN and international organizations as much as possible to minimize the impact of disaster or conflict on dislocated civilians. The lesser the impact on the civilians, the fewer resources they will need. Units then avoid diverting their resources to dislocated civilians. Although the jungle usually has a lower population density, units still need to account for indigenous groups in even the most remote areas during defensive operations.

Chapter 6
Jungle Stability Operations

This chapter outlines the purpose and characteristics of stability operations conducted in the jungle. It describes the planning requirements and adjustments necessary to successfully establish civil security, support civil control, restore essential services, support governance, support economic and infrastructure development, and conduct security cooperation in a jungle.

STABILITY OPERATIONS

6-1. A *stability operation* is an operation conducted outside the United States in coordination with other instruments of national power to establish or maintain a secure environment and provide essential governmental services, emergency infrastructure reconstruction, and humanitarian relief (ADP 3-0). A stability operation occurs as part of decisive action in a joint operation or as an activity (often in peacetime). Stability operations tasks are those tasks executed by a JFC to accomplish stability operations successfully. These tasks may be the focus of the operation's mission, be performed as tasks (specified or implied) in an operation focused on combat, be performed as activities (often in peacetime), or be part of larger operations to consolidate gains. (See ADP 3-07 and MCWP 3-03 for more information on stability operations.)

6-2. Although stability operations tasks performed in the jungle are no different than stability operations tasks performed in other environments, they differ significantly in scale and scope. With sparse populations stretching across vast areas of restrictive terrain, the most challenging aspect of stabilizing a jungle may be determining what essential services civilians require and then transporting the necessary resources to the point of need. However, with only rudimentary antebellum infrastructure and basic essential services present, jungle stability operations prove less complex than in other environments. For example, the lack of large power generation stations reduces the demand for specialized engineers to restore electrical power but increases demand for small generator repair specialists to restore electrical service to villages. Simple efforts, such as the removal of battle-damaged equipment and the reopening of roads and trails, often go a long way towards stabilizing the environment enough for local inhabitants to resume relatively normal patterns of life.

6-3. Stability operations require careful force tailoring to ensure the right mix of security forces and enablers are available to address stabilization requirements as conditions evolve throughout the AO. Initial stability operations often require a preponderance of security forces and transportation assets to restore order and establish civil security. As conditions evolve, and the host nation assumes greater responsibility for basic civil security, the JFC may require additional civil affairs and engineer assets to repair or improve infrastructure. Unique to the jungle, stabilization operations are likely to require significant aviation assets to both assess the population's needs and transport requisite resources to the point of need. Specialized engineer support may be necessary to clear landing zones and drop zones in support of aviation operations.

6-4. Civil affairs, engineers, medical units, and military police have the training and equipment to support stability operations. Many of these forces, such as civil affairs and medical units, also require dedicated sustainment and transportation support to fulfill their mission and commanders must account for these additional requirements. Civil affairs plays a vital role in assessing the population's needs and then working with the JFC, NGOs, and IGOs to improve conditions for the local populace. Engineers provide construction capabilities and can build dislocated persons camps, clear and improve roads, and disarm and remove unexploded ordinance or mines. Medical units provide humanitarian assistance and essential medical services in areas where local hospitals can no longer meet the population's need. Military police assist local security forces with reestablishing law and order and civil control. Military police also conduct PRC to ensure the orderly movement of dislocated civilians and to protect critical assets and resources from looting, exploitation, or capture by enemy forces. Resource control activities include—

- Securing existing harvest storage facilities to prevent spoilage and looting.
- Implementing rationing and distribution programs for key commodities (such as food and fuel).
- Establishing border security, including customs procedures, to prevent arms smuggling, human trafficking, and other contraband such as moving drugs or currency.
- Regulating and securing access to valuable natural resources.
- Stopping poaching and illicit trade in natural resources and developing mechanisms to bring trade under civil control and regulation.
- Developing processes to address issues over resource access, property rights, and ownership.
- Protecting and securing vital institutions, such as government buildings and archives, museums, religious sites, courthouses, water treatment plants, and communications facilities.

STABILITY OPERATIONS TASKS

6-5. Stability operations seek to stabilize the environment for the host nation to begin to resolve the root causes of conflict and state failure. Ultimately stability operations aim to transition full responsibility for security and civil administration to a legitimate authority. This authority may be an IGO, such as the United Nations, or a legitimate governing body of the host nation.

6-6. Stability operations involve both coercive and cooperative actions. Units conduct them in situations when the civil authority cannot provide the necessary security and control for jungle inhabitants as a result of—

- Decisive action during a joint operation.
- Natural disasters resulting in ineffective civil authorities.
- Foreign subversion, lawlessness, insurgency, or terrorism.

6-7. Initially, stability operations focus on the minimum-essential stability tasks of providing security, food, water, shelter, and medical treatment. Once conditions allow, these tasks are a legal responsibility of Army/Marine Corps forces. However, commanders may not use Army/Marine Corps forces conduct all these essential tasks if appropriate civilian organizations are available to adequately perform them. As conditions and time allow, the effort will transition to more deliberate execution of the six stability operations tasks (See JP 3-07, ADP 3-07, or MCWP 3-03 for additional information on stability operations.)

6-8. The Army/Marine Corps utilize different, yet compatible, stability tasks. See table 6-1 for a breakdown of the stability tasks.

Table 6-1. Joint, Army, and Marine Corps stability tasks

Joint Stability Functions	*Army Stability Operations Tasks*	*Marine Corps Stability Tasks*
Security	Establish civil security	Establish civil security
Foreign humanitarian assistance	Restore essential services	Provide humanitarian assistance
		Support and/or provide restoration of essential services
Economic stabilization and infrastructure	Support to economic and infrastructure development	Support economic and infrastructure development
Rule of law	Support to civil control	Support establishment of civil control
Governance and participation	Support to governance	Support to governance
	Conduct security cooperation	

ESTABLISH CIVIL SECURITY

6-9. Civil security is the provision of security for state entities and the population, including protection from internal and external threats. Establishing a safe, secure, and stable environment is crucial to obtaining local support for military operations. Army/Marine Corps forces establish civil security when conflict or state collapse inhibit HN security and police forces from maintaining order. However, as soon as a HN security

force can perform this task, Army/Marine Corps forces transition civil security responsibilities to them. Civil security sets the conditions for enduring stability and peace.

6-10. When establishing civil security in rural jungle areas, commanders make every effort not to relocate populations from their homes or villages. Relocating large segments of the population to secure areas or camps outside their traditional home or village can create mass discontent and destabilize the AO. This can aid enemy information operations and persuade otherwise uncommitted local populations to actively support the enemy. Because most jungle populations practice agriculture or similar trades, they need to remain on or near their farms. To enable economy of force operations and negate the need to commit combat units to securing small villages, instead of relocating these populations, commanders can man, train, and equip a local force to secure these areas. If possible, this force consists of members of the local community. Commanders can also employ existing HN security forces to conduct basic security tasks such as checkpoint operations and local security.

PROVIDE HUMANITARIAN ASSISTANCE

6-11. Conflict, especially extended conflict, results in human suffering caused by acute shortage of water, food, shelter, clothing, bedding, and medical care. Marine Corps forces often arrive as the first response force and support HN efforts to provide humanitarian assistance with logistics, distribution, communications, and other relief capabilities and supplies. Most often, Marine Corps operating forces work in support of other U.S. government departments and agencies, the host nation, or others. Depending on the situation, providing humanitarian assistance may include three subtasks: providing local security, distributing relief supplies, and supporting dislocated civilians. (See MCWP 3-03 and ATP 3-57.20/MCRP 3-03A.2 [MCRP 3-33.1C] for additional information regarding humanitarian assistance.)

6-12. Providing humanitarian assistance to jungle populations is often complicated by the lack of existing infrastructure, such as roads, bridges, and ports, and the remoteness of villages and population centers. As such, these operations place an increased demand on logistics and often require additional aviation assets to transport aid where ground LOCs are damaged or impassable. Relief supplies may also need to be transported and distributed in packaged versus bulk configuration. Bulk water or fuel may prove too difficult to transport to isolated distribution centers by air or over unimproved or damaged ground LOCs.

SUPPORT TO CIVIL CONTROL/SUPPORT ESTABLISHMENT OF CIVIL CONTROL

6-13. Support to civil control focuses on justice reform, establishing the rule of law, and maintaining public order. Civil control is underpinned by the HN judiciary, police, and corrections systems. Civil control tasks, along with oversight, accountability, and transparency of the justice sector, deter corruption that threatens the security, justice, and legitimacy of the HN government.

6-14. To strengthen civil control and the rule of law, Army/Marine Corps units seek to improve the capability, capacity, and legitimacy of HN judicial and corrections systems by providing training and support to law enforcement and judicial personnel. Army/Marine Corps units focus on implementing temporary or interim capabilities to lay the foundation for HN judicial systems when conducting stability operations in jungle environments.

6-15. Army/Marine Corps forces recognize that civil control in many jungle environments may appear and function differently from in western societies. Because of the vast distances between villages and population centers—and the challenges associated with travelling across jungles—civil control functions are often decentralized, and a federal presence is absent. Commanders do not attempt to force centralized civil control mechanisms onto areas or regions where they did not exist before hostilities or disaster disrupted the environment. Instead, they promote reestablishing decentralized systems and processes for providing civil control. This often means using local councils or leadership to settle civil disputes or concerned citizen councils to maintain order.

RESTORE ESSENTIAL SERVICES/SUPPORT AND/OR PROVIDE RESTORATION OF ESSENTIAL SERVICES

6-16. Restoring essential services allows jungle inhabitants to return to their daily activities and prevents further destabilization. Ideally, the HN government and civilian relief agencies work best to restore essential services. However, when partner organizations are not well established or lack capacity, Army/Marine Corps forces can aid in these tasks until relieved by other organizations. Most often, Army/Marine Corps forces support these HN government and civilian relief agencies in restoring essential services. These agencies, along with the HN government, often possess critical knowledge regarding what services are required, where they are best delivered, and what delivery method works best in the local environment. In this capacity, Army/Marine Corps forces are enablers that provide logistics and sustainment support to relief agencies with the HN government in the lead.

6-17. At the tactical level, essential services are often grouped under the acronym SWEAT-MSO, which stands for sewage, water, electricity, academics, trash, medical, safety, other considerations. Leaders use this acronym to both assess the status of local essential services and then build lines of effort in restoring these services.

6-18. SWEAT-MSO assessments conducted on rural communities in the jungle are tempered by the environmental context prevalent in the given area. Most rural jungle communities rely on the natural environment to provide resources necessary for essential services and do not require the elaborate service systems found in areas with greater population densities. For example, sewage may be handled by composting toilets, water provided by a village's well, electricity generated by small diesel generators, trash disposal by local burning or fertilizer use, and medical treatment by a rotating clinical staff. The challenge for commanders seeking to restore essential services across rural jungle areas is not in the complexity of the services, but in ensuring that simple services are restored across wide areas characterized by restrictive terrain. Often, restoring trafficability along key roads, trails, and waterways goes a long way in restoring the local population's ability to receive minimum-essential services. Figure 6-1 offers an example of how planners can use SWEAT-MSO criteria to establish lines of effort for restoring essential services in the jungle.

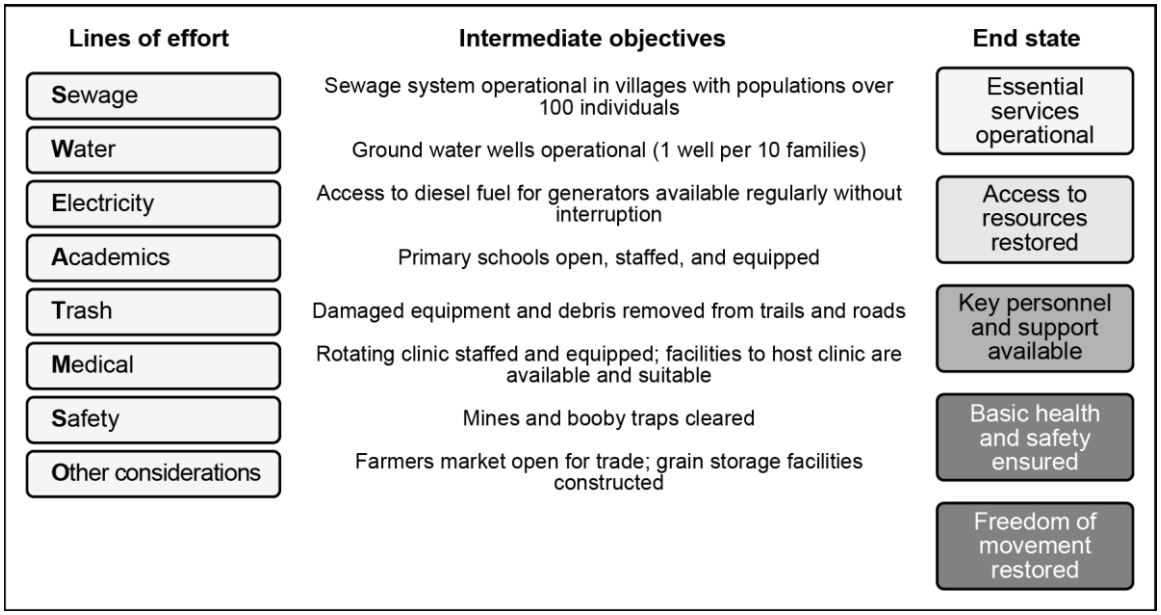


Figure 6-1. Sample jungle SWEAT-MSO lines of effort

SUPPORT TO GOVERNANCE

6-19. Governance is the set of activities conducted by a government or community organization to maintain societal order, define and enforce rights and obligations, and allocate goods and services fairly. Effective, legitimate governance ensures these activities are transparent, accountable, and involve public participation. Elections, while often an end state condition in planning, do not ensure these outcomes. Typically jungle environments have societies divided along ethnic, tribal, or religious lines, so elections may further polarize factions. If a host-nation's government or community organizations cannot provide governance, the country may need some degree of military support. In extreme cases where civil government or community organizations are dysfunctional or absent, international law requires military forces to provide basic civil administration.

SUPPORT TO ECONOMIC AND INFRASTRUCTURE DEVELOPMENT

6-20. Long-term stability in the jungle environment requires the creation of a sustainable jungle economy and an infrastructure to support it. In post-conflict and fragile states, HN actors often have the best qualifications to lead efforts to restore and help develop HN economic capabilities, not interagency partners, civilian relief organizations, or interorganizational partners. However, if security considerations or other factors restrict their ability to intervene, Army/Marine Corps units should assist HN entities in fostering sustainable economic and infrastructure development. Preserving assets such as production facilities, hospitals, universities, existing companies, and markets dramatically reduces the time required to reestablish a sustainable level of economic activity.

6-21. Because jungles are predominately rural, the bulk of the jungle economy centers on agriculture. Army/Marine Corps forces supporting economic development direct their efforts towards ensuring farmers have access to resources, such as seeds and fertilizer, and markets to sell or trade their produce. This may require actions to clear or improve LOCs, secure markets, or rebuild damaged infrastructure such as bridges, canals, or levies. The U.S. Department of Agriculture can provide additional information and support for units requiring more intensive agricultural development assistance. Depending on the nation's need and the size of the U.S. presence, Department of Agriculture liaisons may be found on the American Embassy staff or requested through the country team.

6-22. In jungles with identified natural resource deposits, such as fossil fuels or minerals, commanders secure and protect the resource site and the infrastructure required to support its extraction. Commanders consider mines, quarries, refineries, and pipelines as key terrain. Units secure them as soon as possible after the cessation of large-scale combat or disaster recovery operations. Resource sites and infrastructure are vital to fueling the country's economy and facilitating its long-term stability and recovery. Commanders protect these sites from looting or exploitation by the local populace and third-party actors, such as neighboring states, until the legitimate authority entitled to the property and its contents can properly protect them.

6-23. When conducting reconstruction and infrastructure repair, commanders consider using these activities to improve the jungle economy and provide legitimacy to the HN authorities. Local contracts offer a tool for commanders to restore essential services, rebuild key infrastructure, aid economic development, and reduce dependency on U.S. forces and resources. Through contracting officers, commanders award construction or service contracts to local businesses. These contracts then stimulate the local economy by increasing available currency and improving employment. This stimulation additionally reduces the number of unemployed civilians vulnerable to exploitation by guerrillas or insurgents. Local construction contracts can also imbue the community with a sense of pride in the restoration of their village and foster buy-in. When done in concert with the HN or local government, reconstruction projects enhance legitimacy and credibility. However, awarding local contracts for short-term projects does not replace the need for long-term economic planning and the development of stable jobs.

CONDUCT SECURITY COOPERATION

6-24. *Security cooperation* is all Department of Defense interactions with foreign security establishments to build security relationships that promote specific United States security interests, develop allied and partner nation military and security capabilities for self-defense and multinational operations, and provide United States forces with peacetime and contingency access to allied and partner nations (JP 3-20). Security

cooperation comprises multiple activities, programs, and missions, and it is functionally and conceptually related to security force assistance, foreign internal defense, and security sector reform. Security cooperation primarily focuses on interoperability programs with both core partners and the fledgling security forces of a failed or failing state. These programs generally focus on developing security force doctrine and organizations, establishing formalized training and exchange programs, assisting with leader development, evaluating materiel capabilities, assisting with equipping HN forces, and supporting HN forces with specialized capabilities. (See FM 3-22 for more information on security cooperation activities.)

TRANSITION

6-25. The transfer of an AO to a legitimate authority relieves Army/Marine Corps forces of area security/rear area security and stability tasks and represents a transition from operations to consolidate gains to operations to shape or prevent. Conditions on the ground and resources available determine what security and cooperation tasks have priority during the transfer or authority, and afterwards. Sometimes Army/Marine Corps forces occupy long-term garrisons to prevent a recurrence of hostilities, as happened in Europe, Japan, and Korea in the twentieth century. Alternatively, a more robust security cooperation arrangement may exist involving international peacekeeping forces that can supplant a U.S. presence. Regardless of the tasks required in a specific AO, Army/Marine Corps units continue to perform the missions that reflect their strategic roles of shape, prevent, win, and consolidate gains in support of U.S. interests.

6-26. Transitioning an AO from military to civil control requires careful planning and close coordination among unified action partners. Transitions are gradual and often occur on a case by case basis across recovering states. AOs where clearly distinguished stabilization objectives have been met are gradually transitioned to the legitimate civil authority. AOs may not meet stability objectives at the same pace and all AOs will not transition along the same timeline. Criteria for determining when to transition an AO is conditions based, not time based, and requires the presence of a civil authority capable of executing all the stability operations tasks on its own. This is especially true in the jungle, where the difficult terrain compartmentalizes AOs across the state and makes disparity between stabilization efforts more pronounced.

6-27. Just as transitions across the recovering state are gradual and vary by AO, transitions across an AO are gradual and require HN forces to supplant Army/Marine Corps forces at the individual, team, squad, and unit levels. Both the JFC and HN civil and military leadership monitor this transition to ensure unity of effort and cohesion. In addition to threat considerations, planning for transitions in the jungle requires that all parties thoroughly understand—

- Formal and informal civilian leadership and relationships.
- Government institutions and administrative functions.
- Ongoing reconstruction projects.
- Economic systems and initiatives.
- Participating nongovernmental and governmental organizations, established relationships, and cooperation activities, particularly information sharing.
- Significant key events affecting (or likely to affect) operations.

WARFIGHTING FUNCTION CONSIDERATIONS

6-28. An element of decisive action, stability operations are often executed alongside offensive and defensive operations occurring across the joint operations area. As a result, many of the warfighting function considerations previously addressed in Chapters 3, 4, and 5 also apply to stability operations in the jungle environment. The following considerations, organized by warfighting function, address the jungle's environmental impacts on units conducting stability operations.

INFORMATION

6-29. Information operations are a critical component of effective stability operations. The success of stability operations often rests on the local population's perception of Marine Corps' actions in the area. As such, units use information operations to communicate progress, share intent, and garner understanding with affected audiences. An understanding populace, in turn, increases the pace of stabilization and decreases

requirements for security forces, thereby enhancing overall efficiency. Information operations during stability are also used to deny insurgents or irregular forces the ability to exploit a potentially sympathetic population while the AO remains unstable. These operations work best when closely integrated with the intelligence warfighting function to identify how the enemy is using cultural, religious, ethnographic, political, economic, and criminal considerations to their advantage.

6-30. Although technology is constantly extending its reach, many jungle populations lack access to television, radio, and internet. Remote jungle inhabitants may also lack a basic education, and many may be illiterate. Because of this, commanders recognize that information spread is often slower in the jungle than elsewhere and may have to be continually reinforced to achieve the desired effect. Additionally, themes and messages should be simple and are often most effective when communicated in person through an interpreter. Instructions on handbills or pamphlets should include illustrations and not rely solely on text.

COMMAND AND CONTROL

6-31. Stability operations challenge command and control by requiring units to execute a wide range of tasks with a variety of forces across a single AO. During stability operations, tasks can range from area security to infrastructure development, and accomplishing this often requires unique task organizations. Units without previous command relationships or experience working together must develop complementary systems and processes that achieve unity of effort. To achieve unity of effort among unified action partners conducting stability operations, commanders establish a CMOC and ensure appropriate liaisons are exchanged across the command. Because AOs can vary widely in the jungle, commanders may need several CMOCs to address the unique stabilization needs of the local populace. CMOCs and liaisons ensure security operations and stability tasks are not working at cross purposes, and operations to further secure the populace or defeat remaining threats do not undermine economic, infrastructure, or governance initiatives.

Political and Military Objectives

6-32. Stability operations include assessment frameworks that contain qualitative and quantitative criterion to measure progress towards objectives and the effects necessary to meet those objectives. Quantifiable criteria must be measurable and link cause with effect. Qualitative criteria provide context and inform the commander's ability to fully understand an operational environment. Often, quantitative criteria are used to inform and develop qualitative assessments of an operation's progress towards identified political objectives. These criteria are known as measures of performance (MOPs) and measures of effectiveness (MOEs). A *measure of performance* is an indicator used to measure a friendly action that is tied to measuring task accomplishment (JP 5-0). MOPs help answer the question "are we doing things right?" A *measure of effectiveness* is an indicator used to measure a current system state, with change indicated by comparing multiple observations over time (JP 5-0). MOEs answer the question "are we doing the right things?" These measures help determine if changes to the stabilization lines of effort are necessary and are essential to conducting accurate assessments. MOEs and MOPs are also critical to identifying transition points.

6-33. Given the disparities between remote jungle villages, MOEs will likely vary greatly between them. Some villages or communities may have been unaffected by a conflict or disaster that wrought havoc elsewhere. These relatively self-sustaining communities may only require basic assistance to return to normal. Often, stability operations in these areas focus on removing battle damaged vehicles, mines, and booby traps so that inhabitants can use the LOCs for commerce and trade. Other communities, whether due to geography or proximity to fighting, may require significant reconstruction and aid. MOEs and MOPs will differ in these situations and stability operations will progress at markedly different rates.

Note. Commanders should consult the United States Agency for International Development's (also known as USAID) *Field Operations Guide for Disaster Assessment and Response* when conducting their assessments and developing MOEs for relief operations.

Information Operations

6-34. *Information operations* are the integrated employment, during military operations, of information-related capabilities in concert with other lines of operation to influence, disrupt, corrupt, or usurp the decision-making of adversaries and potential adversaries while protecting our own (JP 3-13). Marine Corps amplification is the integration, coordination, and synchronization of actions taken to affect a relevant decision maker in order to create an operational advantage for the commander (MCRP 1-10.2). Information operations (IO) are an important component of effective stability operations and necessary for influencing both the enemy and HN audiences. Vigorous IO influences the perceptions, decisions, and will of the threat, enemy, the jungle population, and other groups in support of the commander's mission. IO objectives are translated to information-related capability tasks that units execute to create the commander's desired effects in and through the information environment. These operations isolate a threat or enemy from sources of support; neutralize hostile jungle populations or gain the support of neutral populations; and mitigate the effects of threat IO, misinformation, and rumors. Developing an effective assessment plan is essential to ensuring IO objectives achieve their intended effect.

6-35. Because jungle communities often lack reliable internet, and terrain may limit the range of radio transmissions, IO may be most effective when conducted in person by small teams or units delivering messages, hosting meetings, or giving classes to villages across the AO. Preferably, the HN government or security forces conduct these meetings with U.S. forces providing logistic support.

Adaptability

6-36. Adaptability is critical to stability operations in the jungle because units often need to perform tasks outside their traditionally prescribed capabilities. The dispersion of rural communities and villages across wide areas often leaves small units responsible for most stability operations tasks in their AO. Effective units have to simultaneously function as security forces and local engineers or police. Flexing between tasks requires adaptable units and leaders willing to use unorthodox methods to meet the needs of the local populace. They must identify and build relationships with unified action partners present in their AO and extend influence beyond their chain of command. Such units require the support of higher headquarters staff capable of forecasting stability requirements and developing flexible plans to adjust as AOs, regions, or states progress through the stabilization framework from failing to recovering states. Commanders employ mission command to promote decentralized leadership and decision making appropriate to the disparate conditions across different AOs. Mission command empowers subordinates to meet the commander's intent by taking proactive steps to stabilize their respective AOs.

Aggressive Coordination and Synchronization

6-37. Effective stability operations require active coordination with unified action partners and HN authorities throughout the AO. The increased number of participants (both military and nonmilitary) and divergent missions and methods create a significant coordination and synchronization challenge. Significant potential for duplicated effort and working at cross-purposes exists. To mitigate this, commanders establish a CMOC to coordinate stabilization activities across the AO. The CMOC coordinates civil, military, HN, NGO, and IGO actions by reviewing stabilization plans, developing and assessing MOEs and MOPs, and ensuring that unified action partners all work towards the same goal.

6-38. Through the CMOC, commanders initiate cooperative efforts with participating civilian agencies and determine where their objectives and plans complement or conflict with those agencies. Commanders can then match Army/Marine Corps force capabilities to the needs of the supported agencies. Reconnaissance and liaison elements—heavily weighted with civil affairs, engineers, and medical personnel—may need to deploy immediately to determine what type of support is required. Overall, consistent, regular coordination fosters trust and makes unity of effort possible in operations where unity of command is challenging to achieve.

6-39. Commanders consider establishing, as necessary, separate organizations for area security and for stability operations to increase coordination and enhance local, NGO, and international support. Organizing forces in this way enables units tasked with conducting stability operations to avoid the stigma of being associated with continued acts of violence in the AO. This can enhance cooperation among U.S. and HN

forces or NGO and IGO partners and increase popular support for economic, governance, and infrastructure initiatives.

Perseverance

6-40. Stability operations entail Army/Marine Corps forces enabling the success of a legitimate HN authority. Achieving this end state often requires the perseverance to partner with HN leaders and influence them to address the underlying causes of instability or revise its policies to address the concerns of disaffected portions of the jungle population. Stability successes achieved by U.S. forces alone are likely to be short lived. Through perseverance and an accurate understanding the society's history and culture, commanders gain an advantage in identifying the problem, recognizing root causes, quickly engaging and assisting key HN leadership, and planning and executing successful stability operations.

Reasonable Restraint

6-41. Stability operations generally impose restrictions on Army/Marine Corps commanders' use of force. Unlike offensive and defensive operations where commanders seek to apply overwhelming combat power at decisive points, restraint is essential to success during stability operations. Area security and stability operations requiring the use of force employ combat power selectively, discriminately, and precisely (yet still at decisive points) in accordance with assigned missions and prescribed legal and policy limitations. Commanders adjust criteria for the use of force and escalation of force measures when AOs transition to predominately stability operations.

MOVEMENT AND MANEUVER/MANEUVER

6-42. Just as the use of force is more restrictive during stability operations, movement and maneuver/maneuver is often limited by requirements to operate among the populace and the need to restore a since of normalcy to the AO. To reduce impacts on the local populace and bolster the legitimacy of the HN authority, commanders will likely face additional constraints (must do) and restraints (cannot do) that directly impact movement and maneuver/maneuver. Constraints may consist of requirements to conducted mounted and dismounted movement in and among local traffic, or to abide by local traffic regulations and speed limits. Restraints may prohibit mounted operations during specific times or in certain areas. Adhering to these limitations may seem risky or counterintuitive; however, they are necessary to return a fragile or failing state to stability. Ultimately, the goal of stability operations is to reduce the need for U.S. forces at all and, as such, increased limitations on movement and maneuver/maneuver occur as stability operations are successful and responsibilities transition to the legitimate civil authority.

6-43. During jungle stability operations, commanders ensure that the movement and maneuver/maneuver of military forces does not cause additional hardships for the local populace or damage to infrastructure. Moving heavy equipment and armored vehicles on jungle trails and roads can do significant damage over time that may impede overall stability operations and require the commitment of additional resources to repair LOCs.

INTELLIGENCE

6-44. Just as in the offense and defense, intelligence and operations officers, in coordination with the rest of the staff, develop a synchronized and integrated information collection plan that satisfies the unit commander's information requirements. However, during stability operations, the information collection plan is informed by the CMOC and may be driven by data collection in support of MOEs and MOPs. Information collection during stability operations also relies heavily on data provided by the HN government, NGOs, and IGOs.

6-45. Within the constraints of OPSEC, commanders coordinate all stability operations with other agencies and forces that share the jungle environment. Importantly, they coordinate appropriate information and intelligence sharing with participating organizations. Commanders work within foreign disclosure limitations to foster information exchange among U.S. forces, HN authorities, partner nations, NGOs, and IGOs. Commanders provide information to these partners to leverage their capabilities and achieve unity of effort. Commanders use information provided by partner organizations to shape stability operations. Often the host

nation, NGOs, and IGOs possess far greater access to the civilian populace and have a wealth of knowledge on the jungle environment.

6-46. One of the most valuable methods for obtaining intelligence in support of stability operations is face-to-face encounters with targeted audiences by unit patrols, HUMINT specialists, MISO specialists, and civil affairs teams. A valuable technique may be to conduct periodic surveys or opinion polls of the civilian population to determine changes in their perceptions and attitudes. Continual Army/Marine Corps presence provides the jungle population a sense of security and allows Soldiers/Marines to develop a detailed knowledge of the "patterns of life" in their assigned AO. Armed with this knowledge, they can detect the absence of the normal or the presence of the abnormal that might indicate a potential threat.

FIRES

6-47. Stability operations are characterized by restrictive FSCMs that limit the use of indirect fires to prevent unintentional civilian casualties and foster a return to normalcy. However, units can employ nonlethal fires, such as illumination, to enhance U.S. or HN forces ability to operate during periods of limited visibility. Nonlethal direct fire munitions are also critical during stability operations to provide police with graduated escalation of force measures for addressing criminal behavior such as looting or rioting.

SUSTAINMENT/LOGISTICS

6-48. Stability operations may require sustainment/logistics support to systems and organizations not traditionally supported by Army/Marines Corps logisticians. The ability to support these systems and entities may require special authorization, authorities, limitations, and procedures. However, this support can be instrumental in building HN capability and capacity as well as supporting intergovernmental, unified action partners, and other groups' abilities to transition an AO back to HN legitimate authorities.

6-49. Like offensive operations, stability operations in the jungle are characterized by small units operating at key locations across wide areas. Locations may include small population centers, such as villages or groups of farms, or critical infrastructure sites, such as bridges. Commanders develop a sustainment plan flexible and responsive enough to provide these forces with the resources necessary to conduct stability operations. Stability operations in the jungle often place increased demand on the following classes of supply:

- Class I: Until essential services are restored, HN forces, IGOs or NGOs, the local populace, and unified action partners may require bulk Class I support from U.S. forces. The demand for bulk Class I is more pronounced during humanitarian assistance missions.
- Class III: It may be necessary to support HN forces with petroleum, oils, and lubricants until their sustainment and distribution systems return to operational capacity. Sustainment planners ensure fuels provided are compatible with HN equipment.
- Class IV: Construction material and barriers are used to support infrastructure repair and physical security or survivability improvements to HN security force installations.
- Class VIII: Depending on the capability and capacity of the local health care system, commanders plan for an increased demand for medical supplies to treat both HN forces and the local populace. Because the area may be without essential services, the need for medication and supplies to treat tropical and endemic diseases will be great. Diseases such as malaria and dysentery likely occur in tropical areas with poor sanitation, and commanders must plan for medication to both prevent and treat outbreaks among their forces. Commanders coordinate with the HN government, NGOs, and IGOs to determine their capability to acquire medication to treat outbreaks among the local population.

6-50. Medical support to stability operations anticipates providing medical care to HN forces, security personnel, and the jungle populace when HN capabilities fail. Unlike Army/Marine Corps forces, HN forces and civilians do not generally evacuate outside the theater and, depending on the availability of resources, may not be eligible for treatment at U.S. facilities in theater. Commanders leverage NGOs, IGOs, and the HN government to develop and support a medical treatment and evacuation plan for the local populace. Often, U.S. forces support this plan by providing both standard and nonstandard air and ground platforms for patient transportation and evacuation.

PROTECTION

6-51. Priorities for protection often change as the focus of decisive action shifts from large-scale combat to stability operations. Commanders continue to identify threats and hazards, critical assets, vulnerabilities, and risk; however, critical assets, threats, and vulnerabilities usually differ from during large-scale combat operations. Critical assets requiring protection during stability operations consist of critical HN infrastructure, such as bridges, ports, water treatment plants, power plants, and hospitals; HN government and security facilities; and economic centers, such as markets. Normally the threat during stability operations consists of irregular enemy forces, including guerrillas and insurgents. U.S. forces often assume an increased level of vulnerability during stability operations. As Soldiers/Marines operate more closely with and among the local populace, they become more vulnerable to attack by insurgents or guerrillas hiding among the population. As they partner more closely with HN security forces, the risk of a foreign security forces attack increases. Commanders recognize this changing nature of protection requirements during stability operations and apply all the elements of combat power to mitigate risk and protect U.S. forces, foreign partners, and the local populace. (See ATP 3-37.15 for more information of foreign security forces' attack prevention and response.)

6-52. Jungle stability operations present unique protection challenges as small units that were once mobile are now dispersed at key locations throughout the AO. Such forces may consist of civil affairs teams, security force assistance units, or provincial reconstruction teams that do not possess an inherent capability to protect themselves from significant threats. As such, commanders allocate available security forces and additional resources to protect those forces. Commanders also ensure that units dispersed across their AO have adequate transportation assets available for rapid evacuation or reinforcement. During jungle stability operations, this rapid movement of forces is best accomplished by aviation assets.

6-53. The threat of endemic tropical diseases, such as malaria, and diseases related to poor sanitation require commanders to work closely with preventive medicine specialists to prevent outbreaks and respond accordingly when they occur. Because essential services are often nonexistent, the local populace will likely lack clean water and sewage runoff may become a problem. This increases the probability of an outbreak of sanitation related diseases, such as dysentery. As Soldiers/Marines operate in and among the population, they are at a greater risk of contracting illnesses. Commanders plan for this by requisitioning additional medication to treat jungle diseases and by adopting preventive medicine practices to prevent outbreaks at sites and locations under U.S. control. Preventive medicine specialists inspect fixed sites frequented by Soldiers/Marines to identify sanitation issues and help units adopt measures to prevent the outbreak and spread of disease.

Security and Protection Measures

6-54. Emphasizing security and protection measures does not mean isolating Soldiers/Marines from contact with the jungle population. Instead, commanders adapt and improve security measures to reflect the changing nature of operations. They balance the inherent risk of working with and among the populace against the risk of further destabilization if they fail to accomplish their mission. To do this, commanders adjust physical security and survivability measures as well as ensure units adapt their local security procedures to protect Soldiers/Marines exposed to threats as they work in and among the populace. Commanders improve survivability at sites where Soldiers/Marines frequent. This includes not only billets and outposts, but HN security force camps and sites. Such locations should be hardened and fortified to protect U.S. forces from unexpected attack. Commanders also implement access control measures that prevent unauthorized persons from entering sensitive areas where they could attack unsuspecting Soldiers/Marines.

Protecting Civilians and Critical Infrastructure

6-55. During stability operations, Army/Marine Corps forces often provide security for NGOs, IGOs, unified action partners, and the local populace. Providing security to unified action partners, HN government personnel, NGOs, and IGOs allows these agencies to focus their efforts and capabilities on the stabilization tasks they are uniquely qualified to support.

6-56. Commanders protect the local jungle population by performing area security to defeat attacks by insurgents or guerrillas and police operations to protect civilians from lawlessness, rioting, and looting. Police operations are best accomplished by working with local police and HN security forces to establish order. If

a local police force is unavailable, commanders prepare to provide this essential service until HN police having training and equipment to maintain order. Military police are manned, trained, and equipped to provide policing expertise; commanders tasked with restoring law and order typically request additional military police forces.

6-57. Commanders protect critical infrastructure by expanding the use of the CAL and DAL to identify and protect assets deemed vital to stabilization efforts. During stability operations in the jungle, critical assets may include bridges, levies, hospitals, police stations, government buildings, water treatment plants, power stations, and markets. While the threat of air and missile attack may be minimal, commanders use the CAL and DAL concept to allocate security forces, such as military police, to protect assets from sabotage or ground attack by guerrillas or insurgents. They also work with HN authorities and security forces to improve physical security and survivability measures at these sites.

Chapter 7

Training for Jungle Operations

Training and preparation for jungle operations can improve effectiveness, confidence, and survivability for Soldiers/Marines tasked with working in this adverse environment. This chapter provides guidance for developing individual and collective training strategies to prepare units for jungle operations. The jungle's dense vegetation, high heat, and excessive rainfall require unique adaptations to methods for camouflage and concealment, navigation, basic shelter, survival, and movement. However, through a comprehensive training plan, Soldiers/Marines can mitigate these challenges and perform with confidence in an otherwise daunting environment.

TRAINING ADAPTED FOR JUNGLE OPERATIONS

7-1. Well-trained troops and leaders can adapt quickly to the jungle's peculiar conditions and often only require the bare necessities to be successful. While equipment and doctrine can be modified to suit the environment, much will depend on how well troops and leaders have mastered their individual and collective training.

7-2. A commander must answer some or all of the following questions when a unit is alerted for operations in a jungle environment:

- Where will the unit train or operate?
- What are the climatic and terrain conditions of the AO?
- How much time does the unit have to prepare?
- What available training areas have climate and terrain resembling the AO?
- What type of operations will troops conduct?
- Will the unit take its own equipment?
- Does any of the unit's equipment require modification (including camouflage painting)?
- What special equipment does the unit require?
- What special maintenance is required for weapons and equipment before deployment to a jungle environment?
- Does the unit have any jungle warfare instructors, troops with jungle experience, or linguists?
- What training assistance is available? Outside instructors? Training aids?
- Does higher headquarters have special SOPs for jungle warfare?
- What information is available about local civilians and allied forces in the AO?
- What are the training requirements (individual and collective) for the specific combatant command the unit is deploying into?
- What changes to the unit's mission essential task list need to be made (if any)?

7-3. Units committed to jungle operations may have to fight as soon as they arrive in the AO. Commanders must make the best use of the preparation time available. Measures which commanders should consider include—

- Making use of time in garrison. Certain jungle subjects can be taught using classroom instruction. This training should begin as soon as possible, so that troops can devote time in jungle training areas to more advanced techniques.
- Making use of local training areas. Although these training areas may not resemble jungle terrain, some jungle techniques can be introduced in them. A unit can expand on this base training when

it deploys to its jungle training or operational areas. In addition, physical training should begin in the local training area as early as possible before deployment.

- Integrating individual training into unit training exercises. Rather than devote field training time to the individual skills required to live in the jungle, a unit introduces these skills early in classes and then practices them during unit training exercises.

7-4. Commanders first assess the assigned mission, environment, unit readiness, and time available. Then they develop a training program to bring the unit to a level where it is fully capable of successfully operating in harsh jungle conditions. Individual training and survival skills are the foundation of effective collective training and, ultimately, successful small unit operations in the jungle. The training priorities listed in paragraphs 7-5 through 7-26 are only a guide and must be tailored for specific circumstances, theaters, and requirements.

CAMOUFLAGE AND CONCEALMENT

7-5. Units can divide camouflage and concealment training into concealment from the ground and concealment from the air. Commanders pay particular attention to movement, color, shadow, and deception. Camouflage and concealment are equally important for sustainment troops. (For a more detailed discussion on camouflage and concealment techniques, refer to ATP 3-37.34/MCTP 3-34C.)

EQUIPMENT OPERATOR TRAINING

7-6. Motor vehicle operators require extensive off-road driver's training to effectively operate navigate the jungle's unimproved roads under adverse weather conditions. Realistic driver training exercises are long and arduous to expose vehicle operators to the rigors of the jungle as well as to the effects of fatigue. Thorough driver training includes gaining proficiency in muddy conditions, restricted terrain, and fording; identifying optimal routes around obstacles; navigating slopes; and managing self-recovery and like-recovery methods.

7-7. Flight operations in the jungle environment require specialized environmental training. The demanding terrain of some jungles leads aviators to overly rely on electronic navigation equipment. The lack of open areas increases the probability of ditching in areas of dense vegetation. The hot and humid conditions, combined with the mountains found in some jungles, make power management and pre-mission planning especially important to mission success and risk management. Pilots and crew train with extraction equipment, such as the jungle penetrator, that they will use when deployed.

SURVIVAL, EVASION, AND ESCAPE

7-8. Training a Soldier/Marine to survive, evade, and escape in the jungle improves confidence, morale, and the likelihood friendly forces can recover them. Because jungle operations are typically conducted by small units operating across large areas, the risk of becoming isolated or captured by the enemy increases significantly. Further, small units operating for prolonged periods away from sustainment bases require the ability to survive in the jungle. These forces require training on jungle field craft; the ability to identify, procure, and prepare indigenous sources of food; and first aid techniques for common jungle diseases. (ATP 3-50.3/MCRP 3-05.1/NTTP 3-50.3/AFTPP 3-2.26 contains techniques on survival, evasion, and escape in the jungle and ATP 3-50.21 contains general information on survival techniques.)

WATER SURVIVAL

7-9. Swimming and water survival techniques are vital skills in the jungle environment. Jungles contain countless rivers and streams and the few bridges available may not be located in areas that support the scheme of maneuver. Soldiers and Marines will have to cross these linear obstacles either by fording, swimming, or constructing rope bridges. This requires, at a minimum, basic water survival skills. Water survival training is outlined in TC 21-21. Marines reference MCRP 8-10B.6. Aviators and those routinely conducting flight operations in the jungle should also be current and qualified on aircraft water egress skills, equipment, and procedures.

LAND NAVIGATION

7-10. Land navigation often proves challenging in jungle regions due to the limited visibility, complexity of the terrain, and degraded status of GPSs and automated battle command systems. Because of this, Soldiers/Marines may have to rely on traditional navigation methods such as dead reckoning or the use of attack points. Such methods typically require proficiency with a compass, a map, and pace count. In jungles without significant terrain features, troops must rely on their compass and pace count to dead reckon to their objective. Although slow, this method of land navigation is often the only option in areas without reliable rivers, streams, or mountains. When these features exist, Soldiers/Marines can use attack points to identify their objective by referencing adjacent terrain features. (See Appendix A for more information on land navigation. See TC 3-25.26 for detailed techniques for land navigation.)

EQUIPMENT TRAINING

7-11. Because the jungle environment affects nearly all military equipment, Soldiers/Marines train on the proper operation, inspection, and maintenance of mission-essential equipment. Equipment training focused for a jungle environment includes—

- The effects of heat and humidity on equipment.
- Efficient operation of the equipment within the limits imposed by the environment.
- Appropriate preventive maintenance procedures and adjustments to maintenance required by the environment. The appropriate equipment technical manual or lubrication order provides specific information concerning hot climate operations and maintenance.
- BDAR operations in the jungle.

CBRN TRAINING

7-12. Training for CBRN events in a jungle typically involves the protective gear worn by Soldiers/Marines. Wearing protective clothing, individual body armor, and protective masks in the jungle environment is uncomfortable, increases fatigue, and reduces combat effectiveness. Troops should not participate in strenuous activity while wearing protective clothing until they are acclimatized. Training in MOPP gear should become progressively more strenuous over time. Commanders implement controls to reduce the risk of heat injuries and dehydration during training conducted in MOPP gear. Commanders can adjust training in accordance with Table 1-1 on page 1-13 to help prevent heat injuries and dehydration.

JUNGLE FIELD CRAFT

7-13. Following a short period of classroom instruction, troops should practice jungle field craft under conditions similar to those under which they will operate when deployed. Commanders can incorporate this training into other unit training events. Subjects to stress include—

- Heat injury prevention.
- Survival.
- First aid.
- Health, hygiene, and field sanitation.
- Proper wear of uniforms and individual protective equipment.
- Construction of hasty shelters.
- Prevention and treatment of snake and insect bites.

7-14. During field craft training, units minimize use of garrison facilities. Transportation units deliver supplies to the field rather than the training unit returning to the rear for them. Troops learn to live without unnecessary personal comforts.

7-15. Troops fashion shelters when the tactical situation permits. The Soldier/Marine can use a poncho as a roof for the shelter. It reduces the need for extensive foliage for camouflage and provides protection from the elements. However, troops still need to apply natural camouflage to break up the outline of the poncho and

reduce the glare of a wet poncho. Figure 7-1 depicts various techniques for constructing a hasty shelter with a poncho.

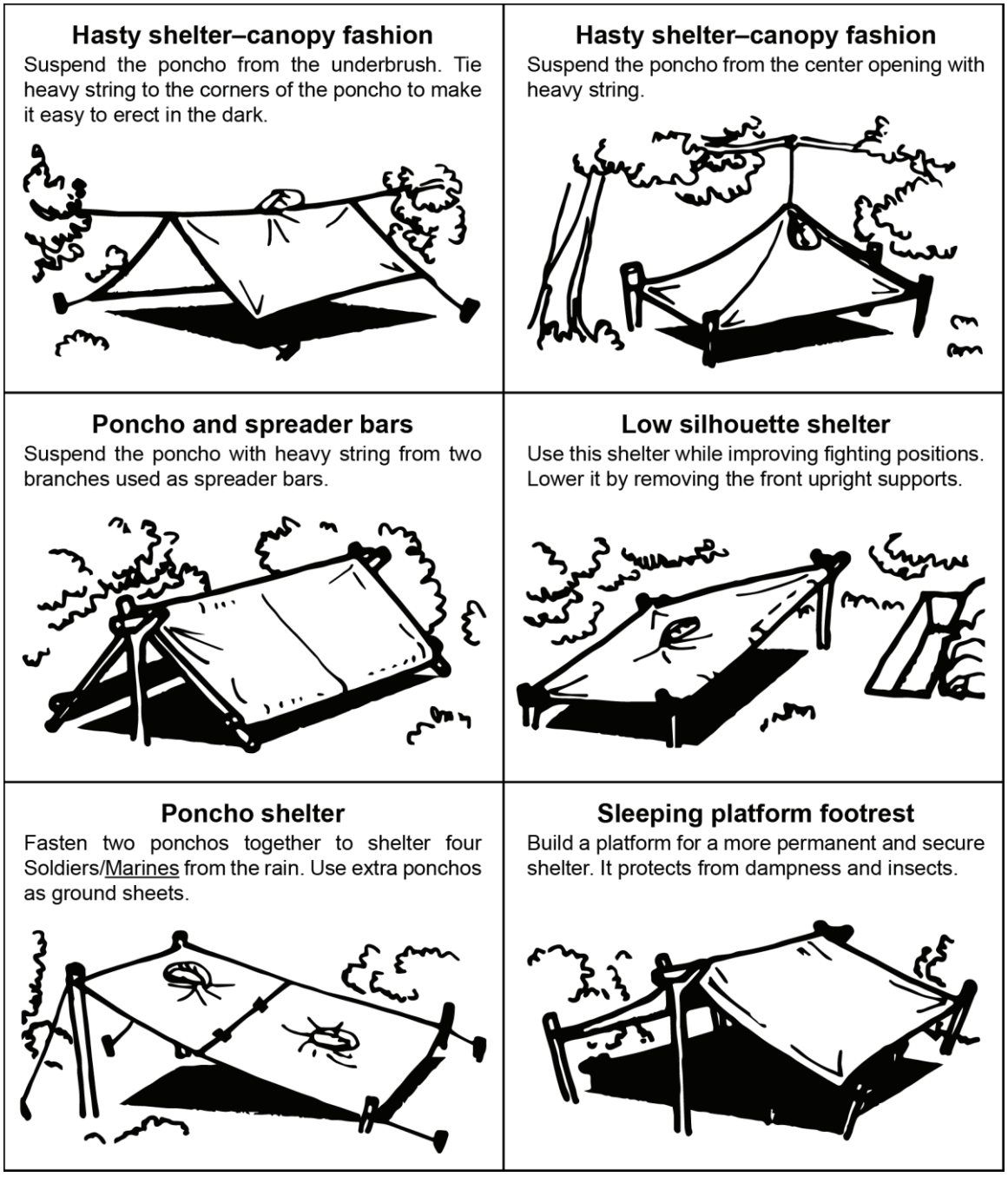


Figure 7-1. Poncho shelters

MEDICAL TRAINING CONSIDERATIONS

7-16. The unit surgeon can provide valuable information on the medical implications of operations in the jungle. Medical training should include preventive medicine concepts essential to keeping nonbattle injuries to a minimum. Nonbattle casualties, due to poor preventive medicine practices, can far outnumber combat

casualties in the jungle. In addition to the immediate lifesaving techniques taught in tactical combat casualty care, Soldiers/Marines operating in the jungle require additional training on—

- Heat injury prevention and treatment.
- Dehydration prevention and treatment.
- Immediate treatment procedures for snake bites.
- Immediate treatment procedures for insect bites and stings.
- Identification and treatment for exposure to noxious plants.
- Prevention methods, signs, symptoms, and initial treatment for common jungle diseases, such as—
  - Chagas disease.
  - Dengue fever.
  - Trypanosomiasis, otherwise known as African sleeping sickness.
  - Leishmaniasis.
  - Leprosy.
  - Lymphatic filariasis.
  - Malaria.
  - Onchoceriasis, otherwise known as river blindness.
- Proper preventive medicine techniques for—
  - Field hygiene.
  - Food handling and preparation.
  - Siting, construction, and use of field expedient latrines.
- Prevention and treatment of immersion foot.
- Prevention and treatment of fungal diseases, such as—
  - Tinea versicolor.
  - Tinea cruris, otherwise known as jock itch.
  - Tinea pedis, otherwise known as athlete's foot.
- Water purification techniques.

PHYSICAL CONDITIONING AND ACCLIMATIZATION

7-17. To the extent possible, physical conditioning and acclimatization should take place simultaneously. A unit that trains in a hot environment begins physical training at night or during the cooler part of the day. Eventually it works up to rigorous training, such as foot marches, at midday.

7-18. Exercise is the best method for acclimatization. Troops in good physical condition adapt more easily to new climates. A 7- to 14-day conditioning period suffices for most troops arriving in a jungle. In the first few days, commanders limit troops to moderately strenuous exercises that become more demanding each day. Troops from warm climates adapt faster than troops deploying from colder climates. Physical training in heated gymnasiums prior to deployment can help ease the acclimatization process. Leaders watch for symptoms of heat injury during the acclimatization period.

WEAPONS TRAINING

7-19. Troops train to maintain weapons proficiency at all ranges; however, most jungle engagements require the ability to rapidly engage targets at close distances during both day and night conditions. Commanders consider equipping individual weapons with close combat optics to enhance their troops' marksmanship at close ranges. Leaders still emphasize training to maintain individual and crew-served weapons in wet and muddy jungle conditions.

MARCH DISCIPLINE

7-20. Although of particular importance to sustainment units, all units deploying to a jungle environment train in mounted road march techniques. Training should emphasize—

- Off road movement over complex terrain.
- Intervals and spacing when moving as a convoy.
- Vehicle spacing to maintain visibility.
- Like and self-recovery techniques.
- Vehicle camouflage.
- Concealment of vehicle tracks.
- Dispersion and security at halts.
- Air defense drills.
- Indirect fire drills.
- Reaction to ambush.
- Reaction to roadblock.

ADJUSTMENT AND CONDUCT OF FIRE

7-21. General techniques for requesting and adjusting indirect fire in the jungle are the same as operations in more temperate climates. However, the jungle's significant changes in elevation and limited visibility present the need to adjust fire using only sound. (See paragraphs 3-142 through 3-148 for more information on adjusting indirect fire methods using only sound.)

AIR DEFENSE

7-22. In jungle operations, the enemy can target any unit with an air attack. The enemy can conduct air attacks and reconnaissance with high performance aircraft, helicopters, and UAS. Units assume enemy air superiority during all field training. When practical, troops use aerial photographs of positions and interviews with pilots to critique air defense measures, both passive and active.

7-23. Passive air defense measures should be a routine part of unit SOPs. Units train to use cover and concealment to protect themselves from aerial detection and attack. Natural cover and concealment is extensive in many jungle areas, but units should not assume that it provides effective passive air defense measures. Units should regularly disperse or dig in vehicles, particularly unarmored vehicles, or provide revetments. When appropriate, commanders post air guards, trained in aircraft recognition, with clear instructions on what actions to take when they sight aircraft. Units not being attacked by aircraft, but are in proximity to the attack, consider remaining stationary and not employing organic weapons in order to avoid detection. Measures to reduce IR signatures can also effectively conceal vehicles and equipment from aerial detection and attack.

7-24. Active air defense measures used in jungle operations do not differ from those practiced in other climates; however, at the small-unit level, leaders need to give additional emphasis to air defense using small arms. When enemy aircraft engage combat vehicles on the move, their immediate action depends on whether or not they are maneuvering in contact with the enemy. If they are in contact, they should continue to maneuver relying on overwatch elements and air defense artillery to engage attacking aircraft.

7-25. Vehicles about to be engaged by enemy aircraft in open jungle without cover move perpendicular to the attacking aircraft to evade rocket or machine gun fire. If possible, these vehicles engage the enemy aircraft with small arms fire. Meanwhile, the remainder of the unit should mass small arms fire to the aircraft's front.

FRATRICIDE CONSIDERATIONS

7-26. The absence of easily identifiable terrain features in the jungle makes knowing a unit's location and the location of adjacent units difficult. Effective unit training incorporates the following fratricide considerations:

- Use a combination of traditional land navigation skills and satellite-enabled precision navigation devices to know unit location and communicate with adjacent units. In this manner, units can synchronize maneuver, enhance awareness, and avoid fratricide. (See Appendix A for more information on land navigation.)

- Ensure positive target identification. Soldiers/Marines review vehicle and weapons identification cards. They know at what ranges and under what conditions positive identification of vehicles and weapons is possible.
- Maintain situational awareness and know unit locations, dispositions, denial areas (minefields), and contaminated areas (such as chemical contamination). Jungle environments often make this more challenging because satellite-enabled navigation devices may be degraded.
- Conduct individual and collective fratricide awareness training. This includes target identification and recognition, fire discipline, and leader training.
- Use common language and vocabulary. Use doctrinally correct terminology and control measures (for example, fire support coordination line and restrictive fire line).
- During terrain analysis, consider how units can use the terrain to mitigate the potential for fratricide while also identifying areas where the terrain may make fratricide more likely. This is particularly important when planning a defense and during EA development. This analysis should include observation and fields of fires, cover and concealment, obstacles and movement corridors, key terrain, and avenues of approach.

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Appendix A

Navigation and Tracking in Jungle Regions

This appendix introduces unique TTP for navigation and tracking in jungle environments. It is not intended to supplant basic land navigation training. Refer to TC 3-25.26 for more information on land navigation. Marines refer to MCTP 3-01A [MCWP 3-11.3] for more information on scouting and tracking.

JUNGLE NAVIGATION TOOLS

A-1. Navigating in the jungle can be difficult for troops not accustomed to it. Terrain association in the jungle proves particularly challenging as the thick vegetation often prevents Soldiers/Marines from recognizing identifiable terrain. Navigation in the jungle can be further complicated by the inability to make straight-line movements. Although slower, dead reckoning is the most effective navigation method used in the jungle. Terrain analysis, constant use of the compass, and an accurate pace count are essential to navigation in this demanding environment.

MAPS

A-2. Topographic surveying is difficult in the jungle. Because of the lack of LOCs, the rugged terrain, and the thick canopy, topographic surveying is done mainly by air and satellite. Although maps of jungle areas generally depict major terrain features (hills, ridges, valleys, saddles, and depressions) accurately, some smaller terrain features—such as draws, spurs, and cliffs—which are actually on the ground, may not appear on the map. Before conducting operations in the jungle, commanders and staff ensure they have the most current and accurate maps available.

COMPASS

A-3. No Soldier/Marine should move in the jungle without a compass. The Soldier/Marine ties one to clothing by a string or boot lace. The three most common methods for dead reckoning with a compass in the jungle:

- Sighting along the desired azimuth. The Soldier/Marine notes an object to the front (usually a tree or bush) in line with the proper azimuth on the compass and moves to that object. This is not a good method in the jungle as trees and bushes tend to look very much alike.
- Holding the compass at waist level and walking in the direction of a set azimuth. This is a good method for the jungle. The Soldier/Marine sets the compass for night use with the long luminous line placed over the luminous north arrow and the desired azimuth under the black index line. However, navigators naturally tend to drift either left or right using this method. Jungle navigators must learn their own tendencies and prevent this drift.
- Sighting along the desired azimuth and guiding a Soldier/Marine forward until they are on line with the azimuth. The unit then moves to the Soldier/Marine and repeats the process. This is the most accurate method to use in the jungle during daylight hours, but it is slow. In this method, the compass Soldier/Marine cannot mistake the aiming point and is free to release the compass on its string and use both hands during movement to the next aiming point.

A-4. The keys to navigation are maintaining the right azimuth and knowing the distance traveled. Soldiers/Marines only acquire skill with the compass through practice. To determine the distance travelled, Soldiers/Marines can use the map to reference terrain features and compare them to identifiable terrain features on the ground. However, the most effective method for determining the distance travelled is maintaining an accurate pace count.

CHECKING TERRAIN FEATURES

A-5. Soldiers/Marines need to note major terrain features (hills, ridges, saddles, depressions, and valleys) as they reach and identify them on the map. Jungle navigators must be cautious about trails. Trails on the ground may not appear on the map, and trails on the map may no longer exist on the ground. Soldiers/Marines must also use caution when referencing streams depicted on maps as these may no longer exist. Troops navigating in or along dry streams must use extreme caution as flash flooding during the jungle's monsoon season can occur rapidly.

RATE OF MOVEMENT

A-6. The rate of movement varies with the physical condition of the troops, the load they carry, the potential for enemy contact, and the type of jungle growth. The normal error in determining rate of movement often involves overestimating the distance traveled. Table A-1 can be used as a rough guide to the maximum distance that Soldiers/Marines might cover in one hour during daylight.

Table A-1. Daylight movement rates

Type Terrain	*Maximum Distance (in meters per hour)*
Tropical Rainforest	up to 1,000
Deciduous Forest, Secondary Jungle, Tall Grass	500
Swamps	100 to 500
Rice Paddies (Wet)	800
Rice Paddies (Dry)	2,000
Plantations	2,000
Trails	up to 3,000

PACE COUNT

A-7. Pace count is often the best method for measuring distance travelled. With this information, Soldiers/Marines can better estimate where they are at any given time. To be accurate, troops must practice pacing over different types of terrain. Ideally, each Soldier/Marine makes a personal pace table like the example shown in figure A-1.

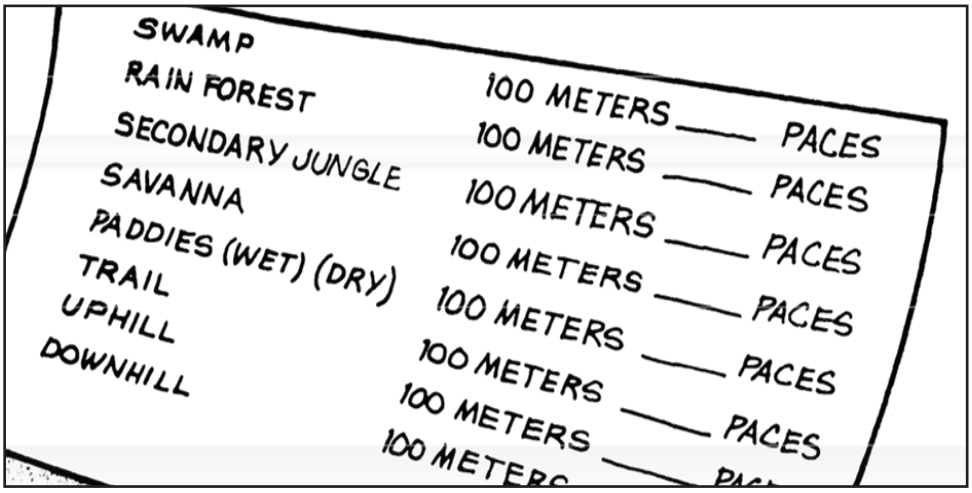


Figure A-1. Pace table

A-8. At least two Soldiers/Marines in each patrol should be compass Soldiers/Marines, and three or four should keep pace count. The artillery fire support team chief should keep an accurate fix on their location, as

should the platoon forward observers. The fire support team chief can be a great help to the company commander in matters of navigation.

A-9. Resection enables troops to locate their position on a map by determining the grid azimuth to at least two well-defined locations pinpointed on the map. For greater accuracy, troops conducting resection use three or more well-defined locations. If a patrol becomes uncertain of its location, and it has no identifiable terrain features available to perform a traditional resection, the commander can conduct resection by indirect fire.

Note. Jungle foliage will often require that artillery marking rounds be sensed by sound.

A-10. Resection by indirect fire substitutes the traditional terrain features used to conduct resection with illumination or white phosphorus rounds. Units fire illumination or white phosphorus airburst rounds on two widely separated grids a safe distance from the lost unit's estimated location. Units take an azimuth to each of these rounds, the back azimuths are calculated, and plotted on the map. The point where the back azimuths intersect is the observer's approximate location. See figure A-2 for an example of resection by indirect fire.

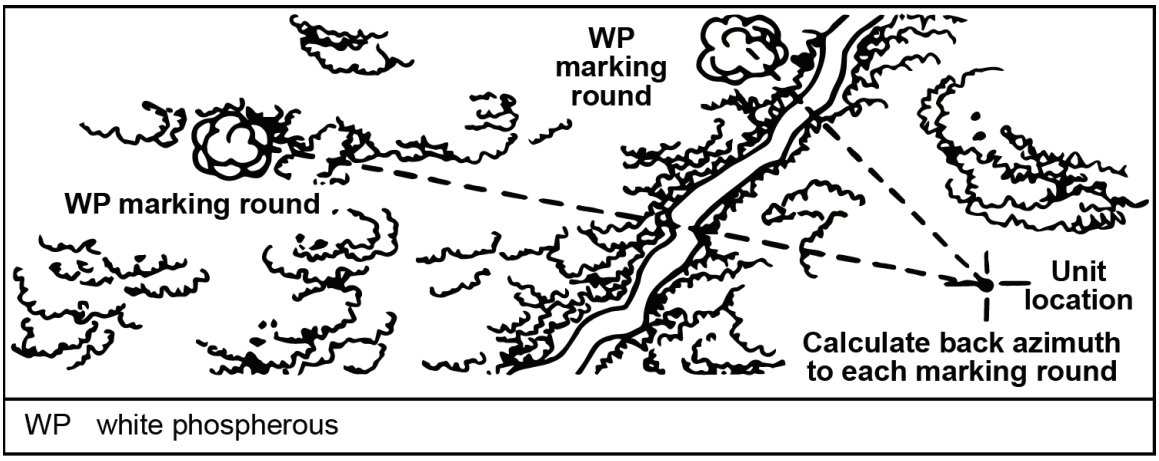


Figure A-2. Resection by indirect fire

AREA NAVIGATION

A-11. Soldiers/Marines can easily correct an error in navigation by orienting on terrain features they can see from a long distance. Even when making primary use of the compass for dead reckoning, Soldiers/Marines can still navigate to an expanded objective that is easily identified by terrain association. Units can then conduct a shorter, point-navigation to their final objective. Two techniques for area navigation are the offset method and the attack point method.

Offset Method

A-12. The offset method facilitates reaching an objective that is not large or not on readily identifiable terrain but is on a linear feature, such as a road, stream, or ridge. The unit plans a route following an azimuth that falls a few degrees to the left or right of the objective. The unit then follows the azimuth to that terrain feature. Thus, when the unit reaches the terrain feature, the members know the objective is to their right or left, and the terrain feature provides a point of reference for movement to the objective. (See figure A-3 on page A-4 for an example of the offset method.)

Attack Point Method

A-13. Soldiers/Marines use the attack point method when moving to an objective not on a linear feature. They choose an easily recognizable terrain feature as close as possible to the objective. The unit then moves to that feature. Once there, the unit follows the proper azimuth and moves the estimated distance to get to the objective. (See figure A-4 on page A-4 for an example of the attack point method.)

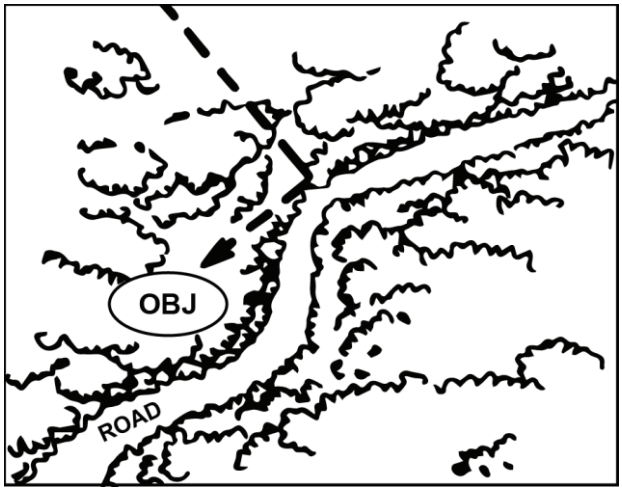


Figure A-3. Offset method

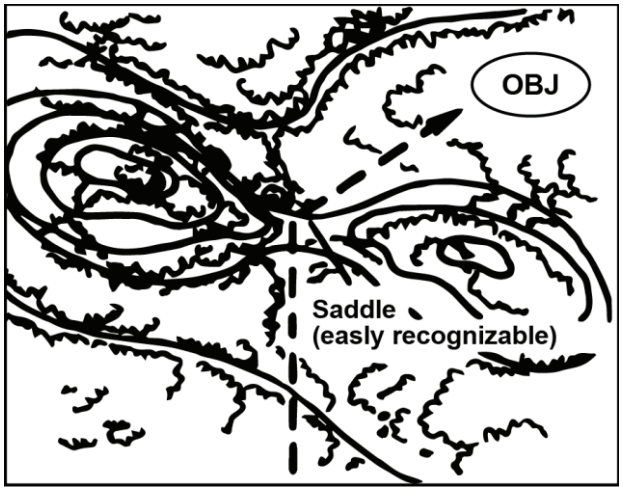


Figure A-4. Attack point method

WHAT TO DO IF LOST IN A JUNGLE ENVIRONMENT

A-14. If lost in the jungle, the first step to recovery is remaining calm. If a troops get lost, they must work together to best determine their current location. After estimating their current location, the troops can then either continue to their objective or move back to their assembly area or other friendly location. Disoriented navigators should try to answer the following questions:

- What was the last known location?
- Did the unit go too far past the objective? (They should compare estimates of rate of march, pace count, and distance traveled.)
- Does the terrain look the way it should? (They should compare their surroundings with the map.)
- What terrain features can they use to help identify their location? (If terrain features are available they can be used to conduct resection.)

A-15. If the unit cannot determine its location using these techniques, the leader can conduct resection by indirect fire. However, this may betray the unit's location or presence to the enemy. If resection by indirect fire is not possible, the commander can use an aerial spotter, if available, to find the lost patrol. The staff can contact and guide the pilot by radio to the unit's last known location. The unit signals to the pilot using a mirror, smoke, panels, or some other visual signal. The pilot can then determine the unit's location and report it to the staff. However, this method may also betray the unit's location to the enemy and must be used with caution.

A-16. When the above methods fail to help the unit identify its location, Soldiers/Marines can eventually find their way out of the jungle by following a river or stream downstream. This is a method of last resort as the river or stream may empty into the ocean in enemy controlled territory, far from other friendly forces or sustainment assets. This may also require the unit to conduct a lengthy and arduous dismounted movement.

NIGHT MOVEMENT

A-17. The principles for navigation at night mimic those for movement during the day; however, night navigation is often slower and requires condensing the size of the patrol to ensure adequate control. Soldiers/Marines may have more difficulty recognizing terrain features during periods of limited visibility, and units may have to continually shoot short azimuths to whatever object or feature they can identify along their azimuth. These factors complicate and slow movement. However, in clear weather, through sparse vegetation, and under a full moon, a unit can move almost as fast by night as by day. With an overcast sky, thick vegetation, or little or no moon, their movement will be slow and hard to control.

Note. Units must have extensive training to effectively navigate at night in the jungle. Night movement requires a significant amount of reconnaissance and tactical patience. Sounds are more audible and carry further at night. The size of the unit, the amount of specific night training, and the distance to the objective are critical planning considerations. Additionally, leaders must prepare for potential casualty evacuations (known as CASEVACs) as the chances of injury rise while conducting night movement.

A-18. The following pointers can assist a unit during night movement:

- Luminous tape attached to the back headgear aids in night travel. Two strips, side by side, each about the size of a lieutenant's bar, work best. The two strips aid depth perception and reduce the hypnotic effect that one strip can cause.
- When no light exists at all, the distance between troops in a patrol should be reduced.
- The lead Soldier/Marine can carry a long stick to probe for steep banks, cliffs, or obstacles.
- In limited visibility conditions, listening may become more important to security than observing. If a Soldier/Marine hears unnatural noises during a patrol, the unit should halt, assume a security formation, and listen for additional noises for at least one minute. If the noise is repeated or cannot be identified, the unit should improve its position and dispatch security patrols. Likewise, Soldiers/Marines can smell to recognize an enemy presence in the area. Soldiers/Marines must remain alert for human scents, such as the smell of a campfire, trash, or body odor.
- All available NVDs should be used.

A-19. Additional jungle navigation practices include—

- Trust the map and compass, but understand the map's possible shortcomings and verify its accuracy when identifiable terrain features are recognizable.
- Use the compass bezel ring during night navigation.
- Do not move on trails or roads.
- Plan every movement and use the plan.
- Do not get frustrated. If in doubt, stop and think back over the route.
- Practice leads to confidence.

TRACKING

A-20. Visual tracking consists of following the paths of people or animals by the signs they leave, primarily on the ground or vegetation. Scent tracking is following people or animals by the odors they produce.

A-21. Soldiers/Marines practice to become proficient at tracking. Because the enemy has ample opportunity for concealment in the jungle, all troops train on general techniques for visual tracking to detect the presence of a concealed enemy, to follow the enemy, to locate and avoid mines or booby traps, and to provide early warning of ambush.

A-22. Tracking works effectively for locating an elusive enemy, particularly when combating a guerrilla or insurgent force. Guerrillas and insurgents normally return to their bases after conducting raids or ambushes. Units can exploit these opportunities by tracking the small groups or teams back to their bases and attacking the larger enemy force located at the camp. Well-developed tracking skills help units gain and maintain contact with the enemy.

SIGNS

A-23. People or animals moving through the jungle leave signs of their passage. Examples of these signs are listed in table A-2.

Table A-2. Tracking points

Primary Jungles	*Secondary Jungles*	*Rivers, Streams, Marshes, and Swamps*	*Savanna*	*Rocky Ground*
Within rain forests and deciduous forests, there are many ways to track. This terrain includes undergrowth, live and dead leaves and trees, streams with muddy or sandy banks, and moss on the forest floor and on rocks. All these features are easily disturbed which makes tracking easier.	Broken branches and twigs.	Footprints on the banks and in shallow water.	If the grass is high (above 3 feet [1 meter]), trails are easy to identify and follow as the grass is knocked down and normally stays down for several days. If the grass is short, it springs back more quickly and trails are harder to identify.	Small stones and rocks are moved aside or rolled over when walked on. The soil is also disturbed, leaving a distinct variation in color and an impression. If the soil is wet, the underside of the stones will be much darker in color than the top.
Disturbed leaves on the forest floor, when wet, appear darker in color when disturbed.	Leaves knocked off bushes and trees.	Mud stirred up and discoloring the water.	Trampled grass points in the direction that the person or animal is traveling.	If the stone is brittle, it chips and crumbles when stepped on. A light patch appears where the stone is broken and the chips normally remain near the broken stone.
Dead leaves are brittle. They crack or break under pressure of a person stepping on them. The same is true of dry twigs.	Branches bent in the direction of travel.	Rocks splashed with water in a quietly running stream.	Grass shows a contrast in color with the surrounding undergrowth when pressed down.	Stones on loose or soft surface are pressed into the ground when walked upon. This leaves either a ridge around the edge or the stone where it has forced the dirt out, or a hole where the stone has been pushed below the surface of the ground.

Table A-2. Tracking points (*continued*)

Primary Jungles	*Secondary Jungles*	*Rivers, Streams, Marshes, and Swamps*	*Savanna*	*Rocky Ground*
Where the undergrowth is thick, especially on the edges of the forest, green leaves of the bushes that have been pushed aside and twisted show the underside of the leaves; this side is lighter in color than the upper surface. To find this type of trail, the tracker observes the wider, general area for color contrast instead of directly at the suspect location.	Footprints.	Water on the ground at a point of exit.	If the grass is wet with dew, the missing dew shows a trail where a person or an animal has traveled.	Where moss is growing on rocks or stones, a boot or hand may scrape or disturb some of the moss.
Boot impressions may be left on fallen and rotting trees.	Tunnels made through thick vegetation.	Mud on grass or other vegetation near the edge of the water.	Mud or soil from boots may appear on some of the grass.	
Marks may be left on the sides of logs lying across the path.	Broken spider webs.		If new vegetation is showing through a track, the track is old.	
Similar to disturbed moss on rocks, roots running across a path may show signs that something has moved through the area.	Pieces of clothing caught on the sharp edges of bushes, thorns, or briars.		In very short grass (12 inches [30 centimeters] or less), a boot damages the grass near the ground and leaves a footprint.	

TECHNIQUES TO DEFEAT TRACKING

A-24. The following techniques may be used to deceive or defeat trackers:

- Walking backwards. The heel mark tends to be deeper than that of the ball of the foot. The pace is shorter.
- More than one person stepping in the same tracks.
- Walking in streams.
- Splitting up into small groups.
- Walking along fallen trees or stepping from rock to rock.
- Covering tracks with leaves, dirt, or brush.

WARNING

A tracker should always be alert to the possibility that the enemy is leading the unit into an ambush.

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Appendix B

Negotiating Jungle Obstacles

This appendix introduces techniques and equipment that dismounted troops can use to cross these obstacles.

OBSTACLES

B-1. Units operating in the jungle have to cross many obstacles. The most difficult obstacles will be streams and cliffs. Soldiers refer to TC 3-97.61 for more information on types of ropes, rope care, knots, anchors, and rappelling techniques. Marines refer to MCRP 12-10A.3 (MCRP 3-35.1C) and MCRP 3-01B.1 (MCRP 3-11.4A) for a more information on ropes, knots, anchors and rappelling procedures. Additionally, units operating in the jungle frequently have to insert or extract troops and units in places where helicopters cannot land. Soldiers refer to ATP 3-18.10 for techniques, equipment, and training to conduct special patrol insertions and extractions, fast-rope insertions and extractions, and air-water operations.

ROPES

B-2. Ropes are critical equipment for negotiating many jungle obstacles. The two types of rope are characterized as either static or dynamic.

B-3. Static rope is designed for rappelling operations, load hauling, and rope installations. This rope allows for minimal stretch and is the preferred type of rope for rappelling operations. Static rope stretches about 5 to 15 percent at the point of failure, and about two percent under a working load. The minimum tensile strength for a 7/16 inch (11-millimeter) static rope for military use is 4,500 pounds. Static ropes range from 1/8 to 7/16 inches (3 to 11 millimeters) in diameter.

B-4. Dynamic rope is designed for climbing. This rope allows for stretch within the rope's fibers. This is a disadvantage when rappelling, Prussic climbing, and during other applications. Dynamic ropes are also more susceptible to abrasion and wear. They have about a 5 to 10 percent working stretch. The minimum tensile strength for a 7/16 inch (11 millimeter) rope for military use is 4,500 pounds (2,041 kilos).

Note. The breaking strength of a rope is always greater than its safe working capacity. The difference is a "safety factor." Individual ropes can vary greatly in minimum breaking strength. Even though a rope may not break under this load, the fibers are stretched beyond their elastic limit. Thereafter the strength of the rope is permanently reduced. Exposure, wear, use, and bending decrease a rope's strength over time. The strength of a rope that is slung over a hook or contains a knot is reduced by about 30 percent; sharp bends over corners will cut strength by 50 percent; sand or grit between the fibers will quickly cut the fibers and sharply reduce the rope's strength.

B-5. Ropes and cord used in rappelling operations are constructed in two basic configurations—kernmantle and laid rope. Kernmantle rope contains a core of nylon fibers protected by a woven sheath similar to parachute or 550 cord (kern means core; mantle means sheath). The internal core of kernmantle rope is constructed of a continuous multifilament-nylon yarn spun into continuous parallel strands. This internal core is then covered with a nylon-braided outer sheath. Laid rope is constructed from strands of material twisted into a rope of a specific diameter. For years the standard workhorse rope for all rappelling operations was 7/16-inch (1 centimeter) laid nylon rope. These ropes are easy to inspect for serviceability by twisting the fibers. However, these ropes tend to untwist slightly when under load. This untwisting can cause kinking and spinning. Laid rope is also highly susceptible to abrasion. Therefore, units only use laid ropes for rappelling in emergencies.

B-6. The following specifications pertain to the standard military nylon-laid climbing and rappelling rope:

- 120 feet (36 1/2 meters) long.
- 7/16 inches (11 millimeters) wide.
- At least a 4,500-pound (2,041 kilos) tensile strength.
- One-third stretch factor (at point of failure).
- May lose as much as 15 percent of rope strength when wet.

B-7. Tips and techniques for cleaning and maintaining ropes:

- Clean a muddy rope by washing it in water, but not in salt water.
- Do not pull a rope over sharp edges. Place layers of heavy cloth or grass between the rope and any sharp edge to prevent cutting fibers.
- Do not drag, step on, or drive over a rope laid on sand or dirt.
- Keep a rope dry. If it gets wet, dry it as soon as possible to prevent rotting. (A mildewed rope has a musty odor and inner fibers have a dark, stained look).
- Do not leave a rope knotted or tightly stretched any longer than needed.
- Never splice a climbing or rappelling rope.
- Inspect a rope often, both the outside and the inside. Untwist a few strands at different points to open the rope to check the inside.
- Avoid tying nylon rope in such a way that causes rope-to-rope friction. Nylon rope burns when it rubs against other nylon ropes. Melted nylon and dark streaks indicate burns.
- Check the rope for dirt and sawdust-like material inside. These indicate rope damage.
- Check a rope in different places; any weak point in it weakens the entire rope.
- Destroy or cut up ropes deemed unsafe. This prevents Soldiers/Marines from using the rope for hoisting or rappelling. Troops can use short pieces for toggle ropes and for other purposes that do not involve loadbearing operations.

KNOTS

B-8. Soldiers/Marines train on the four classes of knots: Class I—joining knots, Class II—anchor knots, Class III—middle rope knots, and Class IV—special knots. The variety of knots, bends, bights, and hitches is almost endless. Soldiers/Marines can lose knot tying skills and must practice tying knots to maintain proficiency. (See figure B-1 for examples of common knots and knot tying terms. For more information regarding knots and their uses, Soldiers refer to TC 3-97.61 and Marines refer to MCRP 12-10A.3 [MCRP 3-35.1C]. For more information on additional knots and directions to tie them, see ATP 3-50.21.)

TRAVERSING VERTICAL OBSTACLES

B-9. Vertical obstacles are common in the jungle. Most vertical obstacles consist of cliffs, ridges, and ravines caused by mountains and rock formations. Soldiers/Marines use rappelling techniques to descend these obstacles, while they use climbing techniques to ascend vertical terrain. The fundamentals, techniques, and equipment used to rappel and climb in the jungle mimic techniques used in any other environment.

RAPPELLING

B-10. Rappelling is a means for an individual or group to descend a vertical surface quickly. Rappelling requires specialized training and equipment for Soldiers/Marines to conduct it safely. Three main types of rappels exist: hasty, body, and seat-hip rappel. (For detailed information on rappelling, Soldiers refer to TC 3-97.61 and Marines refer to MCRP 12-10A.3 [MCRP 3-35.1C] and MCRP 3-01B.1 [MCRP 3-11.4A].)

B-11. Soldiers/Marines use the hasty rappel only on moderate pitches. Its main advantage is that it is easier and faster than other methods. Soldiers/Marines must wear gloves to prevent rope burns. A hasty rappel consists of tying a rope to an anchor point at the top of the obstacle, such as a tree, and then using the rope to steady Soldiers/Marines as they walk down the obstacle backwards.

Knots to tie the end of a rope to an object (anchor knots)



The bowline will not slip under strain, yet users can easily untie it.



The clove hitch works as an intermediate anchor with tension applied at all times to prevent slipping.



The round turn is used with two half hitches.

Knots to tie the ends of two ropes together

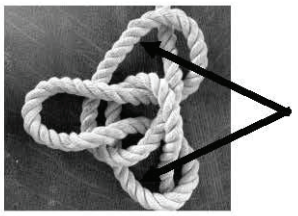


A square knot is used to tie ropes of equal diameter together.



The double sheet bend knot is used to tie two ropes of unequal diameter together.

Knot to tie a rope to the middle of a second rope



The butterfly knot is used to pull a line tight.

Note. After a butterfly note is tied for a rope bridge—or any other purpose where a great amount of strain or tension is applied to knot—it becomes almost impossible to untie. Pieces of wood or pipe inserted through the two loops or wings of the knot make it easier to untie.

Knots for special uses



The Prussic knot is used to tie one rope around another. One rope will slide along the other if there is no tension, and it will hold is tension is applied. This knot is tied off with a bowline knot.



Bowline knot on a bight forms a double loop.



Bowline knot on a coil is used by the first and last troops on a climbing rope to take up unnecessary slack. This knot uses a half-hitch knot behind the bowline knot.

Figure B-1. Common knots

B-12. During a body rappel, the Soldier/Marine rappelling faces the anchor point and straddles the rope. Soldiers/Marines turn up their uniform collar to prevent rope burns on the neck. They can wear gloves and other clothing to pad the shoulders and buttocks. The rappelling Soldier/Marine then pulls the rope from behind, runs it around either hip, diagonally across the chest, and back over the opposite shoulder. From there, the rope runs to the brake hand, which is on the same side of the hip the rope crosses. Rappelling Soldiers/Marines lean out at a sharp angle to the rock. They lead with the brake hand down and face slightly

sideways. The foot corresponding to the brake hand precedes the guide hand at all times. While rappelling, Soldiers/Marines keep the guide hand on the rope above them to guide themselves—not to brake themselves. They keep their legs spread well apart to stay relatively straight for lateral stability and their back straight to reduce friction. To brake, the Soldier/Marine rappelling leans back and faces directly toward the rock area so each foot is horizontal to the ground.

B-13. The seat-hip rappel differs from the body rappel in that the friction is absorbed by a carabiner that is inserted in a sling rope seat and fastened to the Soldier/Marine rappelling. This method provides a faster and more frictional descent than other methods. Soldiers/Marines can use the seat-hip rappel to exit helicopters.

CLIMBING

B-14. Soldiers/Marines climb to negotiate vertical terrain that is too steep to walk. They use a variety of refined techniques to climb different types of vertical terrain. Military climbing techniques stress keeping the weight centered over the feet while using the hands primarily for balance. Soldiers/Marines combine the balanced movement required to walk a tightrope and the technique used to ascend a ladder. When the terrain is too steep for climbing, Soldiers/Marines can ascend it using roped climbing techniques, such as Prussic climbing, which require specialized training and equipment.

MOVING ACROSS RIVERS AND STREAMS

B-15. Soldiers/Marines train on several expedient ways to cross rivers and streams. The method used depends on the width and depth of the water, the speed of the current, the time and equipment available, and the friendly and enemy situation

B-16. There is always a possibility of equipment failure. For this reason, every Soldier/Marine learns to swim. In all water crossings, leaders station several strong swimmers either at the water's edge or, if possible, in midstream to help anyone who gets into trouble.

B-17. If Soldiers/Marines accidentally fall into the water, they should swim with the current to the nearer bank. Swimming against the current is dangerous because the force of the current quickly tires the swimmer.

FORDING

B-18. Fording is a method for crossing a shallow body of water without bridging, boats, ferries, or rafts. Fording works only at locations where the current, composition of the bottom, and approaches permit the passage of personnel and vehicles while the wheels, tracks, or feet remain in contact with the bottom at all times.

B-19. Combat vehicles can ford shallow wet gaps that have a limited current velocity and stable bed. Fording kits are available for some vehicles to increase fording depth (such as the deep water fording kit for the Marine Corps' M1A1 tank). Fording is possible for current velocities that are less than five feet (1.5 meters) per second. If fording a riverbed, the site must be firm and free or large rocks or other obstructions. Vehicles cannot ford at sites with steep banks. Additionally, conditions at vehicle fording sites generally deteriorate the more forces use them. Engineers may need to build new or reinforce heavily used fording sites. Vehicle technical manuals contain specific depth capabilities and required adaptations for vehicles. (For more information on vehicle fording, see ATP 3-90.4/MCTP 3-34A [MCWP 3-17.8].)

B-20. Good fording sites have the following characteristics:

- Concealment on both banks for dismounted troops.
- Paths or roads approaching the fording site for vehicles.
- Few large rocks in the riverbed. Submerged large rocks are usually slippery and make it difficult to maintain footing. Rocks can also cause a fording vehicle to throw a track.
- Shallow water or a sandbar in the middle of the stream. Troops may rest or regain their footing on these sandbars.
- Low banks to make entry and exit easier. High banks normally mean deep water. Deep water near the far shore is especially dangerous as the troops may be tired and less able to get out.
- A solid bottom. Vehicles and personnel may become stuck in soft or muddy riverbeds.

B-21. Individual fording is conducted at a slight angle against the current. Soldiers/Marines should keep their feet wide apart and drag their legs through the water, not lift them, so that the current will not throw them off balance. Soldiers/Marines can use poles to probe as they walk to help find deep holes and maintain footing.

FLOATATION AIDS

B-22. Troops can use floatation aids to traverse deeper streams that lack a strong current. They can modify their standard issue equipment and elements found in the jungle environment to construct effective floatation aids. Soldiers/Marines can use their trousers, poncho, and other equipment to construct floatation aids.

Trousers

B-23. Soldiers/Marines use their trousers as flotation devices. They remove and prepare trousers by tying the bottoms of the legs tightly. They enter the water to waist depth and hold the trousers behind the shoulders, with the waist open. Bring the trousers quickly over their head and bang them into the water in front filling them with air. Squeeze and hold the waist together to prevent the escape of the trapped air and use the buoyancy of the trousers to float.

Poncho Life Belt

B-24. Soldiers/Marines use their poncho as a belt. They roll green vegetation tightly inside a poncho and fold the ends over to make a watertight life belt. Then they roll the poncho into a cylinder at least 8 inches in diameter and tie it. They wear it around the waist or across one shoulder and under the opposite arm like a bandoleer.

Poncho Brush Raft

B-25. Soldiers/Marines use their ponchos to build a raft. They use these steps to construct a poncho brush raft (refer to figure B-2):

- Using two ponchos, tie the neck of each tightly by using the drawstring.
- Spread one poncho on the ground with the hood up so that it will end up inside the raft.
- Cut fresh, green brush (avoid thick branches or wood stakes) and pile it on the poncho to a height of 18 inches.
- Place an X-frame made of small saplings—1 to 1.5 inches (2.5 to 4 centimeters) in diameter and 3 to 4 feet (1 to 1.2 meters) long—on the brush. Anchor this frame by tying the poncho's drawstring to the center of the X-frame.
- Pile another 18 inches (45 centimeters) of brush on top of the X-frame.
- Compress the brush slightly and fold up the poncho. Tie ropes or vines diagonally across the corner grommets and straight across from side grommets. The sides of the poncho should not touch.
- Spread the second poncho on the ground, with hood up, next to the bundle made of the first poncho and brush. Roll the bundle over onto the center of the second poncho and tie the second poncho across the sides and diagonally across the corners. This raft will safely float 250 pounds (113 kilos) and is very stable.

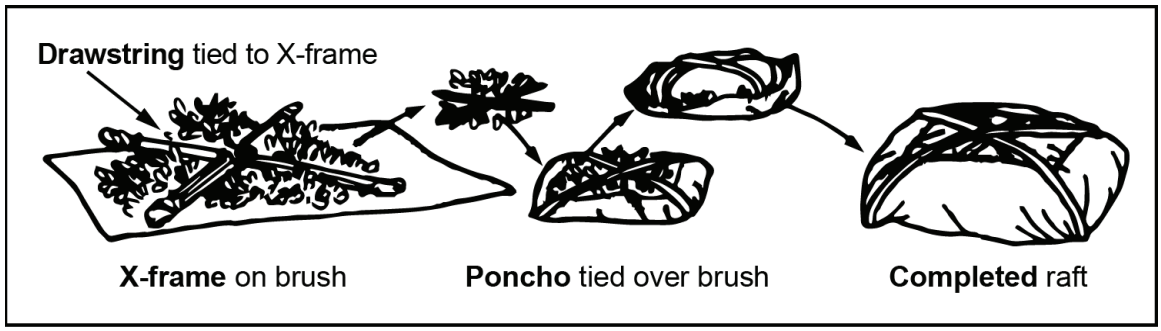


Figure B-2. Poncho brush raft

Australian Poncho Raft

B-26. When there is not enough time to gather a lot of brush, Soldiers/Marines use their ponchos to build an Australian poncho raft. It uses a Soldier's/Marine's combat equipment for bulk and buoyancy. Normally, two troops make this raft together. It is more waterproof than the poncho brush raft but will float only about 80 pounds of weight (refer to figure B-3). Soldiers/Marines use this raft to move their equipment and not ride.

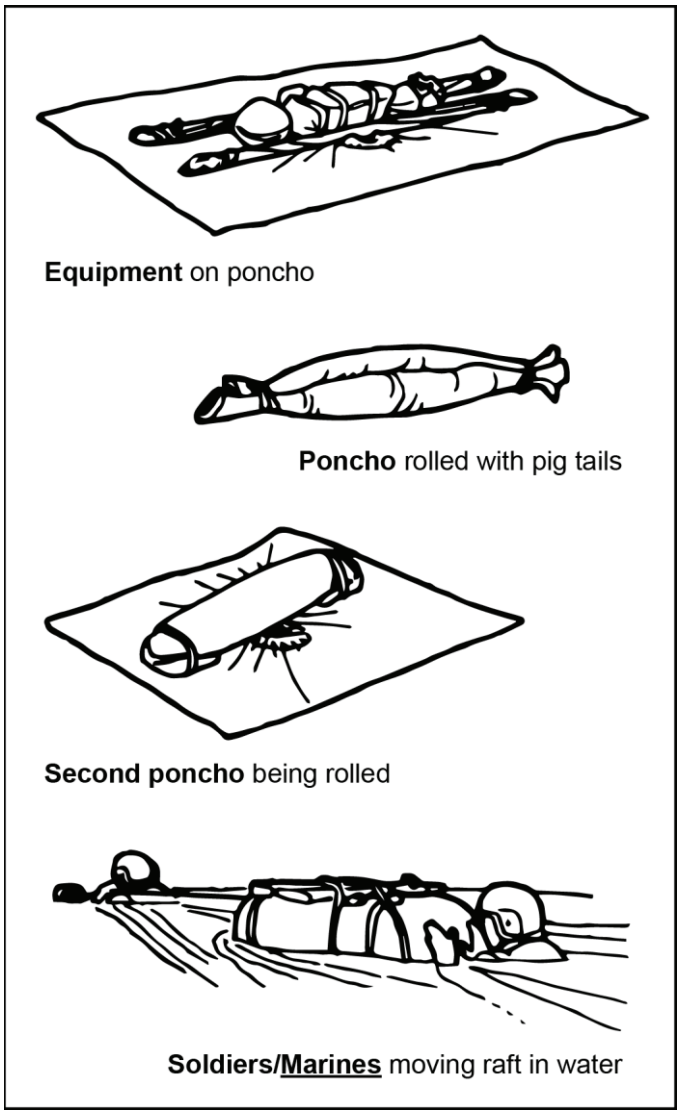


Figure B-3. Australian poncho raft

B-27. To construct an Australian poncho raft—

- Place one poncho on the ground with the hood facing up. Close the neck opening by tying it off with the drawstring.
- Place two poles (or branches), about 1 to 1.5 inches (2.5 to 4 centimeters) in diameter and 4 feet (1.2 meters) long in the center of the poncho about 18 inches (45 centimeters) apart.
- Next, place the rucksack, and any other equipment desired, between the poles.
- Snap the poncho together. Hold the snapped portion of the poncho in the air and roll it tightly down toward the equipment. Roll from the center out to both ends. At the ends, twist the poncho to form "pigtails." Fold the pigtails inward toward each other and tie them tightly together with boot laces, vines, communications wire, or other available material.

- Spread the second poncho on the ground, neck closed and facing up.
- Place the equipment bundle formed with the first poncho, with the seam (tied pigtails) facing down, on the second poncho.
- Roll and tie the second poncho in the same manner as the first.
- An empty canteen tied to one end of a rope with the other end tied to the raft helps in towing. One Soldier/Marine pulls on the rope while the other pushes the raft. Place weapons on top of the raft and secure them with ropes. They secure their weapons to the raft with quick releases. The raft is now ready for the water.

Note. When launching any poncho raft or leaving the water with it, take care not to drag it on the ground as this will cause punctures or tears.

Water Wings

B-28. Two or more air-filled plastic bags, securely tied at the mouth, can be used as field expedient water wings. Other expedients include empty water or fuel cans and ammunition canisters.

Log Raft

B-29. Soldiers/Marines use logs, either individual or lashed together, to float troops and equipment. They carefully select logs for rafts as some jungle trees are too dense to float. They can check whether certain wood is suitable by putting a wood chip from a tree in the water. If the chip sinks, so will a raft made of that wood.

Rope Bridges

B-30. Rope bridges work for crossing moving water. Soldiers/Marines use them to quickly cross streams and small rivers with strong currents. Because of the stretch factor of nylon ropes, Soldiers/Marines do not use them to cross gaps of more than 65 feet (20 meters). Static ropes are used to cross gaps larger than 65 feet (20 meters). (For information on additional rope installation methods, such as fixed rope, suspension traverse, and vertical hauling, Soldiers refer to TC 3-97.61, and Marines refer to MCRP 12-10A.3 [MCRP 3-35.1C].)

B-31. Soldiers/Marines follow several steps when constructing a rope bridge. First, they determine how much rope they need to cross the obstacle. To measure the width of a linear obstacle (also refer to figure B-4 on page B-8)—

- Select a straight section of the stream.
- Pick two points opposite each other (A and B).
- Stand at B; turn in a direction parallel to the stream; walk off 10 paces. Mark that point as point C (B to C = 10 paces).
- Continue walking in the same direction 10 more paces. Mark that point as point D (C to D = 10 paces).
- Turn at a right angle away from the stream and walk until you are on line with points C and A. Mark this point as point E. Determine the distance between D and E by converting the pace count to meters. In this example, 1 pace is equal to 3.2 feet (1 meter) and the pace count is 5 paces. Therefore, the distance between D and E is 16 feet (5 meters).
- The distance from D to E is equal to the distance from A to B. Therefore, the width of the stream is also about 16feet (5 meters).

Note. After determining the approximate width of the river or stream, additional length must be added to the rope to account for the anchor. A general guide is that the rope used to fashion the bridge should be double the length of the river's width (see figure B-4 on page B-8).

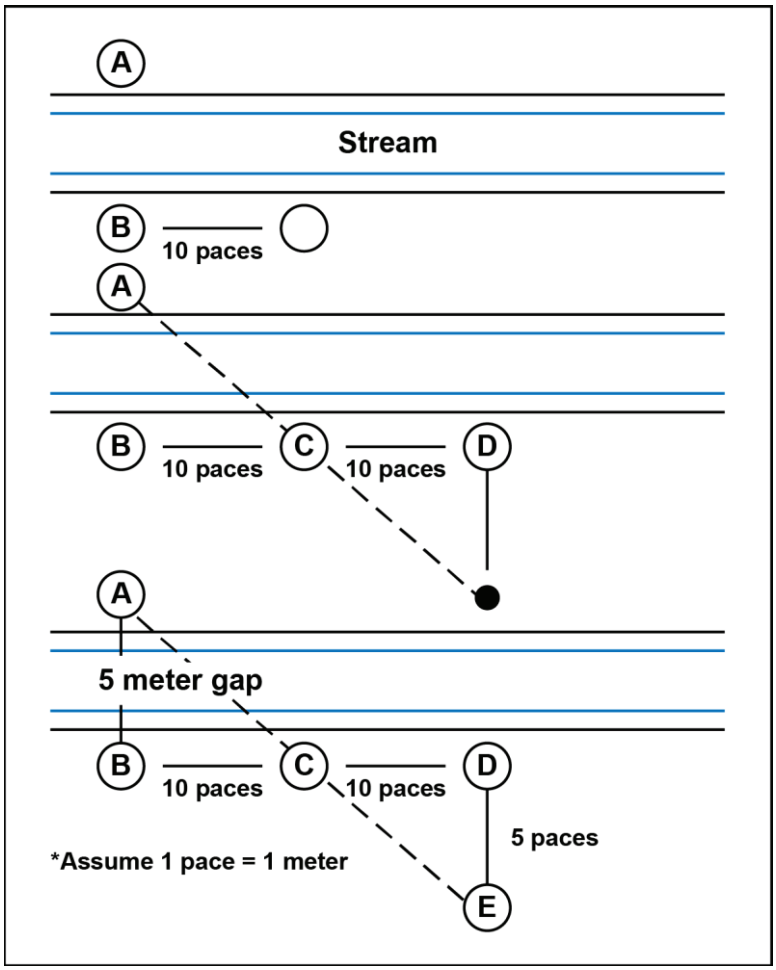


Figure B-4. Determination of river width

B-32. To erect a rope bridge, one Soldier/Marine swims a rope across the river or stream. First, the Soldier/Marine gets a rope at least double the width of the stream. The Soldier/Marine anchors one end of the rope at point A and walks the other end of the line upstream as far as it will go. Then, the Soldier/Marine ties a sling rope around the waist of a strong swimmer and, using a snap link, attaches the anchored rope to the Soldier/Marine. The Soldier/Marine swims diagonally downstream to the far bank, pulling the rope across (refer to figure B-5).

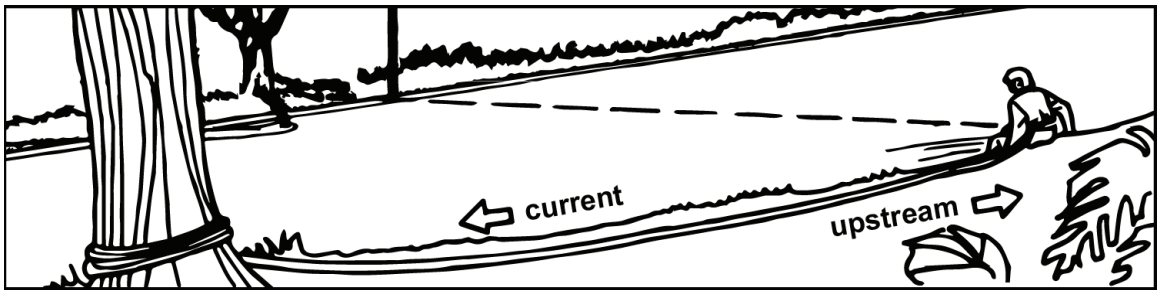


Figure B-5. Swimmer pulling rope across

One Rope Bridge

B-33. Soldiers/Marines can construct a one rope bridge either above or at water level. The bridge is constructed the same regardless of the level.

B-34. To construct a one rope bridge—

- The Soldiers/Marines pull the bridge rope around the upstream side of the far side anchor point and temporarily secure it without tying a knot. On the near side, Soldiers/Marines place a transport-tightening system in the bridge rope by tying a double butterfly knot and placing two snap links in the butterfly. They pass the running end of the rope around the downstream side of the near side anchor point and through the two snap links.
- When Soldiers/Marines prepare this transport-tightening system, one Soldier/Marine on the far side pulls the butterfly knot approximately a third of the distance across the river. That Soldier/Marine then secures the rope to the far side anchor point using a round turn and two half-hitches. Troops on the near side then pull the slack out of the bridge rope until the butterfly knot returns on the near side. (The bridge rope must be as tight as possible so that it will not sag when used.) The Soldiers/Marines tie off the bridge rope against itself using two half-hitches with a quick release in the last half-hitch.

B-35. Soldiers/Marines use one of the following methods to cross a one rope bridge above water:

- Commando crawl. Lie on the top of the rope with the instep of the right foot hooked on the rope. Let the left leg hang to maintain balance. Pull across with the hands and arms, at the same time pushing on the rope with the right foot. (For safety, each Soldier/Marine ties a rappel seat and hooks the snap link to the rope bridge).
- Monkey crawl. Hang suspended below the rope, holding the rope with the hands and crossing the knees over the top of the rope. Pull with the hands and push with the legs. (For safety, each Soldier/Marine ties a rappel seat and hooks the snap link to the rope bridge). This is the safest and the best way to cross the one rope bridge.

B-36. To cross a one rope bridge at water-level, Soldiers/Marines hold onto the rope with both hands, face upstream, and walk into the water. They cross the bridge by sliding and pulling the hands along the rope. (For safety, each Soldier/Marine ties a sling rope around their waist, leaving a working end of about 3 to 4 feet [1 to 1.2 meters]. The Soldier/Marine ties a bowline in the working end and attaches a snap link to the loop. Then the Soldier/Marine hooks the snap link to the rope bridge.)

Two-Rope Bridge

B-37. Construction of a two-rope bridge resembles that of the one-rope bridge, except it uses two ropes—a hand rope and a foot rope. Soldiers/Marines space these ropes about 5 feet (1.5 meters) apart vertically at the anchor points. (For added safety, they snap link attachments to the hand rope from a rope tied around the waist. They move across the bridge using the snap link to allow the safety rope to slide.) To keep the ropes a uniform distance apart as troops cross, they tie spreader ropes between the two ropes every 15 feet (4.5 meters). As troops move along the two-rope bridge, they will have to remember to disconnect and reconnect their safety rope at each spreader rope. Soldiers/Marines tie a sling rope to each bridge rope with a round turn and two half hitches.

Other Crossing Methods

B-38. Soldiers/Marines can use suspension traverses, bridges, and cableways to move large numbers of troops or heavy equipment over wide rivers and ravines, or up and down cliffs in a short period. Because they need heavy equipment to construct these expedients, such crossing methods are practical only if the needed construction equipment can be transported to the site by aircraft or other transportation assets, such as motor vehicles, watercraft, or pack animals.

ROTARY-WING AND TILT-ROTOR OPERATIONS

B-39. Many places in the jungle have a canopy or terrain that will not permit a helicopter or tilt-rotor aircraft to land to conduct infiltration or exfiltration of troops. Other techniques and equipment, such as rappelling,

special patrol insertion/extraction system (commonly referred to as SPIES), fast-rope insertion and extraction system (commonly referred to as FRIES), a Jacob's ladder, cargo nets, and jungle penetrators can be used to conduct infiltration and exfiltration. Special equipment and training is required for each of these techniques, many of which are used only by SOF. (Soldiers refer to ATP 3-18.10 for detailed information on these techniques. Marines refer to MCRP 3-01B.1 [MCRP 3-11.4A] for helicopter rope suspension techniques operations.)

Appendix C

Individual Combat Load in Jungle Operations

This appendix discusses rucksacks. It also discusses weights carried by Soldiers/Marines. The appendix closes with a discussion of using rucksacks.

RUCKSACKS

C-1. Because dismounted movement in the jungle often proves arduous and physically demanding, Soldiers/Marines configure individual loads so they drop or hide their rucksacks for recovery later. This allows them to move freely on patrol. Soldiers/Marines place some essential items in the rucksack due to the extended nature of operations. They remove those items when the situation dictates. They avoid leaving combat-essential and sensitive items in cached or dropped rucksacks. Unit SOPs dictate the equipment and items individual Soldiers/Marines wear or carry, what items they pack in the rucksack, and what items they can cache or leave behind for short duration missions. Units distribute packing lists designed for squads and platoons with careful attention given to balancing loads. (For a more detailed discussion on load management, Soldiers refer to ATP 3-21.18.)

WEIGHT CARRIED

C-2. As the weight carried by Soldiers/Marines in the jungle environment increases, their mission performance and effectiveness decreases. Carrying weight of nonmission essential equipment can impair mission performance. The commander tells units how long they can expect to conduct operations without resupply as so units can plan the equipment, supplies, and ammunition to carry.

C-3. Leaders reinforce specific company and platoon SOPs with inspections and checks prior to operations. Leaders demand strict adherence to packing lists while accounting for individual Soldier/Marine physical abilities in the distribution of unit essential equipment. Noncommissioned officers, in conjunction with the commander, inspect, monitor, and adjust loads according to the mission variables.

C-4. In the jungle environment, water constitutes a large percentage of a dismounted troop's load. Units issue and Soldiers/Marines carry additional water sources when conducting operations in the jungle environment. Water sources include bladders or personal hydration systems capable of carrying up to five to ten quarts (9 liters) of water, especially in the dry season. Soldiers/Marines also carry water purification equipment and supplies in order to source potable water, reducing the amount of water that they must carry and the necessity of resupply.

C-5. Ammunition normally makes up the greatest part of each troop's load, and ammunition supplies must be planned to last until troops can be resupplied. Units establish preconfigured helicopter and tilt-rotor capable loads of ammunition, based upon the mission variables, in the support area for emergency or immediate resupply of dismounted elements. Every Soldier/Marine should carry colored smoke grenades and flares for signaling. The unit also distributes trip-flares and claymore mines for security. Special ammunition, including mortar rounds, explosive, and less-than-lethal munitions, must also be accounted for.

USE OF THE RUCKSACK

C-6. Small units conducting offensive operations in jungle terrain often need to be self-reliant for extended patrols and long-duration missions. Units routinely plan to operate for five to seven days without resupply carrying what they need in rucksacks. This independence is a form of security; it mitigates the risk that frequent resupply will betray the unit's location. It also enables the unit to conduct the extended patrols required during a movement to contact. Self-reliance also lowers the demand on sustainment/logistics elements and associated infrastructure.

C-7. To minimize the weight of rucksacks, commanders carefully analyze the mission, and ensure Soldiers/Marines carry nothing but essential equipment. Leaders distribute detailed packing lists and complete thorough inspections prior to a mission ensuring Soldiers/Marines carry only essential items and equipment.

C-8. Although it may be beyond their control, commanders conducting dismounted offensive operations attempt to avoid close combat while their troops are under load. Leaders develop SOPs and individual load plans to ensure that Soldiers/Marines carry all combat equipment, such as ammunition and first aid kits, on their person and not packed in the rucksack. This enables units to ground or cache their rucksacks rapidly without degrading combat effectiveness. A unit moves from point to point with rucksacks on and then removes and secures them at the objective rally point before engaging in close combat.

C-9. When troops make unexpected contact with the enemy, such as during a meeting engagement, Soldiers/Marines immediately drop their rucksacks and execute actions on contact as they rehearsed in their battle drills. If the enemy drives the troops to withdraw and abandon their rucksacks, upon return, Soldiers/Marines inspect their equipment for booby traps and IEDs. They also prepare for an ambush or attack at the site.

C-10. On short duration missions (48 hours or less), Soldiers/Marines use assault packs (or similar equipment) instead of carrying rucksacks. This method improves mobility and speed while reducing noise. Platoons and squads operating out of a patrol base for short-duration missions consolidate and conceal their rucksacks at the patrol base before moving out. The only time Soldiers/Marines carry rucksacks is when the mission does not call for a return to the patrol base. If the unit must break contact and cannot feasibly return to their patrol base, they must inspect all equipment for booby traps, IEDs, and mines when they eventually return.

C-11. Leaders deliberately select cache sites for rucksacks, equipment, and supplies. Units identify an easily recognizable terrain feature and, from that, determine a distance and azimuth to establish the actual cache site. Effective sites avoid natural lines of drift and obvious trails into cache sites. In the event a unit cannot return to the cache site, Soldiers/Marines remove and add items they will need into their individual combat load.

C-12. Cached rucksacks have natural camouflage for concealment. Units can dig pits and bury their rucksacks so long as they can return the area to its natural state when the burying is complete. The equipment cached should be arranged in such a manner that Soldiers/Marines can easily determine if anyone has tampered with the equipment. When returning to cache sites to recover rucksacks, leaders inspect the equipment for booby traps, mines, and IEDs before allowing Soldiers/Marines to disturb it. This helps in preventing casualties from booby traps and mines. Troops avoid grouping around the equipment when recovering it. Units maintain security at all times while redistributing the rucksacks.

C-13. Rucksacks are expendable. In all situations, properly packed rucksacks contain nonessential items. Leaders tailor individual combat loads so that the loss of all rucksacks would not result in mission failure.

Appendix D

Techniques for Fratricide Reduction in the Jungle

The dense foliage, often indistinguishable terrain features, and noncontiguous nature of jungle operations make it difficult to distinguish between enemy and friendly forces. Commanders mitigate the increased risk of fratricide through comprehensive risk management, the appropriate balance of command and control, and by ensuring a shared common operational picture across echelons and formations. This appendix presents fratricide prevention measures and risk considerations to assist commanders with fratricide mitigation.

FRATRICIDE REDUCTION

D-1. *Fratricide* is the unintentional killing or wounding of friendly or neutral personnel by friendly firepower (ADP 3-37). Like other risks, commanders use the risk management process to identify fratricide hazards and then develop and implement controls. (See ATP 5-19 for detailed instructions on integrating the risk management process into operations.)

MAGNITUDE OF THE PROBLEM

D-2. The pace of contemporary combat is rapid, and the noncontiguous nature of jungle operations creates command and control challenges for leaders at all echelons. With numerous small units conducting movements to contact or other patrols, the risk of a unit getting lost and engaging a friendly unit increases during jungle operations. This is aggravated by the communications challenges associated with dismounted troops operating across restrictive terrain. These small units often lack the redundant and more powerful communications equipment of mounted forces, and they may frequently experience periods of difficulty establishing communications with adjacent units and higher headquarters. The risk of fratricide is further compounded by the nature of combat in the jungle. Characterized by unexpected engagements at close ranges, units can easily mistake a friendly patrol for that of the enemy. Identification is made more difficult by the jungle's thick foliage and the impact of environmental obscurants such as fog.

REACTING TO FRATRICIDE INCIDENTS

D-3. Small units and patrols engaged by friendly fire take the following steps:

- React to contact until it is recognized as friendly fire.
- Cease fire.
- Identify self and attempt to make verbal contact with the friendly unit.
- Use a visual recognition signal, such as smoke, to identify self as friendly. Units standardize visual recognition signals per SOP.
- Report on the higher headquarters net—
  - Unit location.
  - Distance and direction of incoming fire.
- Protect Soldiers/Marines and request medical assistance as needed.

D-4. Units that mistakenly engage friendly forces take the following actions:

- Cease fire.
- Identify self and attempt to make verbal contact with the friendly unit.
- Use visual recognition signal, such as smoke, to identify self as friendly.

- Report on higher headquarters net—
  - Unit location.
  - Estimated location of engaged unit.
  - The type of fire.
  - The target effects.
- After identifying self as friendly and receiving confirmation from other unit, attempt to assist the unit with tactical casualty care, security, and casualty evacuations.

D-5. Units that observe a friendly fire incident take the following actions:

- Seek cover and protect self.
- Report on higher headquarters net—
  - The locations of both units.
  - The location of the incident.
  - The distance and direction between engaged units.
  - The type of fire.
  - The target effects.
- Establish communications with engaged units and identify self as friendly.
- Use visual recognition signal, such as smoke, to identify self as friendly.
- Once identified as friendly, provide assistance with tactical casualty care, security, and casualty evacuations.

PREVENTIVE MEASURES

D-6. Incorporating composite risk management to reduce the potential for fratricide occurs throughout the operations process. The following measures reduce the risk of fratricide and are integrated into planning, preparing, and executing operations:

- Planning. Commanders identify, articulate, and implement fratricide control measures when planning an operation. Fratricide prevention considerations during planning include:
  - Clearly articulate the enemy's disposition, anticipated location, and most likely COA.
  - Identify equipment and uniform that distinguishes the enemy from friendly forces.
  - Clearly designate subordinate unit AOs.
  - Establish control measures to prevent units from mistakenly entering an adjacent unit's AO.
  - Use clearly identifiable terrain features to establish AOs and control measures.
  - Establish restrictive FSCMs—such no-fire areas, restrictive fire areas, and restrictive fire lines—to limit fires around friendly forces.
  - Establish and brief visual and auditory recognition signals, both near and far. Units preferably use recognition signals established by a common SOP.
  - Use a graphic aid, such as a sand table, to clearly brief the mission and concept of operations.
  - Establish a redundant communications plan, to include a common higher headquarters net or "sheriff's net."
  - Clearly brief the ROE.
  - Establish intervals for communications checks and situation reports from subordinate units.
- Preparation. Commanders incorporate the following measures to prevent or mitigate fratricide while preparing for an operation:
  - Conduct rehearsals, such as a combined arms rehearsal, with all subordinate units.
  - Conduct rehearsal on a full-size terrain model that depicts all control measures.
  - Require subordinate units to walk and talk through their movements and tasks during the rehearsal.
  - Conduct thorough communications checks between all subordinate units and the higher headquarters.

  - Rehearse actions taken during a friendly fire incident.
  - Rehearse casualty evacuations and MEDEVAC procedures.
  - Conduct backbriefs to ensure subordinates understand control measures, near and far recognition signals, and the location and mission of adjacent units.
  - Require subordinates to brief the ROE and escalation of force procedures during the backbrief.
- Execution. During execution, leaders use real-time risk management to overcome unforeseen fratricide risks. Commanders conduct the following to mitigate the risk of fratricide when executing an operation:
  - Conduct communications checks and receive periodic situation reports from all subordinate units.
  - Control subordinate unit movements by phase line or other established control measures.
  - Adjust operations as necessary in accordance with subordinate progress, rates of march, and movement tables.
  - Ensure regular communications among adjacent units.

D-7. Graphic control measures are standardized tools that commanders use to clarify their intent, add precision to their concept, control subordinate movement, and communicate their plan. As such, clear graphics can be an important measure for reducing the risk of fratricide. Commanders at all levels must understand the definitions and purpose of operational graphics and the impact of these control measures on their operations. See ADP 1-02 for more information on graphic control measures.

D-8. Confirmation briefs and rehearsals are primary tools for identifying and reducing fratricide risk. A *confirmation brief* is a brief subordinate leaders give to the higher commander immediately after the operation order is given to confirm understanding (ADP 5-0). It is their understanding of the commander's intent, their specific tasks, and the relationship between their mission and the other units' missions in the operation. Commanders consider the following when conducting confirmation briefs and rehearsals to aid in reducing fratricide:

- Confirmation briefs ensure subordinates understand their commander's intent, the mission, and the concept of operations. Confirmation briefs often identify areas of confusion, complexity, or planning errors.
- Confirmation briefs should require subordinates to identify the control measures that restrict their movement and fire.
- Confirmation briefs require subordinates to brief both near and far recognition signals during the confirmation brief.
- Rehearsals extend to all levels of command and involve all key leaders. At the small-unit level (company and below), all Soldiers/Marines participate in the rehearsal.
- Commanders use confirmation briefs and rehearsals to ensure subordinates know where fratricide risks exist and what to do to reduce or eliminate the risk.

D-9. Maintaining situational awareness is key to fratricide reduction. Units develop techniques to gain and maintain situational awareness when operating in the jungle. Techniques include—

- Monitoring the next higher headquarters network.
- Conducting regular communications checks and situation reports with adjacent units.
- Establishing redundant measures for accurately identifying the unit's location.

D-10. Reducing the risk of fratricide requires a holistic approach to comprehensive risk management. The following are not intended to restrict initiative; however, units can employ these measures as appropriate to further reduce the risk of fratricide:

- Include the risk of fratricide in running estimates of units utilizing the MDMP. These risks, and the associated controls, are expressed in the operation order or fragmentary order.
- Maintain an accurate common operational picture that includes the following:
  - Require regular situation reports from subordinate and adjacent units.
  - Maintain awareness of subordinate and adjacent units' locations.

  - Continue to update the situation template as units receive information on the enemy.
- Ensure positive target identification. Review vehicle and weapons identification procedures and know at what ranges, and under which conditions, positive identification of friendly vehicles and weapons is possible.
- Recognize the signs of combat stress. Take quick, effective action to reduce stress and maintain unit cohesion.
- Conduct individual and collective fratricide awareness training, target identification and recognition training, fire discipline, and leader training.
- Keep the plan as simple as possible; the greater the variables in timing and movement, the greater the risk of fratricide.
- Use SOPs that are consistent with doctrine to simplify orders and foster interoperability between units without habitual relationships. Periodically review and update SOPs as needed.
- Provide subordinates with the time to adequately plan, prepare, and communicate with each other.
- Use common language and vocabulary and doctrinally correct terminology and control measures.
- Establish a uniform primary, alternate, contingency, and emergency (PACE) plan for all subordinates taking part in the operation.
- Co-locate command posts when possible, especially during complex and risky operations such as a passage of lines.
- Establish and exchange liaison officers as appropriate.
- Make sure ROE are clear and understood by all.
- During terrain analysis, consider how the terrain either increases the chances of fratricide or can be used to prevent fratricide. Assess observation and fields of fire, cover and concealment, obstacles and movement corridors, key terrain, and avenues of approach. For example, the unit can use a large hill or cliff as a unit boundary to block a unit's fire from entering another unit's AO.
- Be in the right place at the right time. Use position location and navigation devices (such as GPS) and battle command systems to know the unit's location and the locations of adjacent units (left, right, forward, and follow-on).
- Conduct thorough after action reviews on all fratricide or potential fratricide incidents.

REDUCING THE RISK OF FRATRICIDE DURING PLANNING

D-11. The following considerations offer insight into how commanders can thoroughly integrate fratricide reduction techniques into the planning and orders process. The factors and considerations are listed where they would likely appear in an operation order; however, they may warrant evaluation in other paragraphs or when preparing for an operation.

D-12. Task Organization.

- Has the unit worked under this task organization before?
- Are SOPs compatible with the task organization (especially with attached units)?
- Are special markings or signals (for example, cats' eyes, chemically activated lights, or panels) required and available for positive identification of uniforms and equipment?
- What special weapons or equipment will Soldiers/Marines use? Do they look or sound like enemy weapons or equipment?

D-13. Situation.

- Enemy Forces.
  - Are there similarities between enemy and friendly equipment and uniforms that could lead to fratricide?
  - What languages do enemy forces speak? Could these contribute to fratricide risk?
  - What are the enemy's deception capabilities and its past record of deception activities?
  - What is the disposition of enemy forces?
- Friendly Forces.

- When operating with foreign security forces, are there similarities with the enemy, in language, uniform, and equipment, which could increase fratricide risk during combined operations?
- Could differences in equipment and uniforms among U.S. forces increase fratricide risk during joint operations?
- What is the friendly deception plan?
- What are the locations of adjacent units (left, right, forward, and follow-on)?
- Are there neutrals and noncombatants in the area?
- How experienced are the forces conducting the operation? Is this a unit's first combat operation?
- Will fatigue be a factor for friendly forces during the operation? Has an effective sleep plan been developed?
- Have units trained to proficiency with the equipment used during the operation? This is especially important for communications equipment and optics.
- What are the expected MOPP requirements for the operation? How can this reduce situational awareness or the ability to communicate?

- Attachments and Detachments.
  - Do attached elements know the above information regarding enemy and friendly forces?
  - Are detached elements supplied the above information by their gaining units?
- Weather.
  - What are the expected visibility conditions (light data and precipitation) for the operation?
  - What effect will heat and cold have on troops, weapons, and equipment? This is particularly relevant for optics and communications equipment.
- Terrain. How can the area's topography and terrain either increase the risk of fratricide or be used to reduce the potential for fratricide? Evaluate observation and fields of fire, cover and concealment, obstacles and mobility corridors, key terrain, and avenues of approach.

D-14. Mission. Is the mission, as well as all associated tasks and purposes, clearly understood?

D-15. Execution.

- Maneuver. Are main and supporting efforts identified and aware of fratricide risks and prevention measures?
- Fires (direct and indirect).
  - Are priorities of fires identified?
  - Has the fire execution matrix or overlay been developed?
  - Are attack aviation and CAS targets clearly identified?
  - How will ground forces identify themselves to aviation assets?
  - What FSCMs have been established?
  - Have final protective fires been established?
- Engineer Tasks.
  - Are the locations of friendly and enemy minefields known?
  - Are obstacles identified, along with the approximate time needed for reduction and breaching of each?
- Tasks to Each Subordinate Unit.
  - Has the direct-fire plan been developed?
  - Are support-by-fire positions established with clear limits and fields of fire?
- Tasks to Sustainment Units.
  - Have locations of friendly forces been reported to sustainment units?
  - Do maneuver units know the location of sustainment units operating in the AO?
  - How will sustainment units and logistics convoys identify themselves to aviation assets?

- Coordinating Instructions.
  - Will a rehearsal be conducted? What type of rehearsal will be conducted? Are direct and indirect fires included?
  - Are appropriate control measures clearly explained and illustrated in the operation order and overlays? Have they been disseminated to Soldiers/Marines who have a need to know? What is the plan for using these control measures to synchronize the battle and prevent fratricide?
  - Have target and vehicle identification drills been practiced?
  - Do subordinate units know the immediate action, drill, or appropriate signaling techniques if they come under unknown or friendly fire? Is there a backup action?

D-16. Sustainment.

- What are the locations of combat trains and is this known by all participating units?
- What are the locations of field trains and is this known by all participating units?
- How will trains be identified? Will vehicles be marked?
- Do medical and maintenance personnel know the routes between units and echelons?

D-17. Command and Signal.

- Command.
  - Are subordinate commanders familiar with each other? Have they rehearsed together and established communications?
  - What command is responsible for synchronizing fire and maneuver?
  - What is the succession of command and how will changes to command and control be communicated?
- Signal.
  - Do instructions include signals for special and emergency events?
  - Do instructions include how to identify friendly forces to aircraft?
  - What are near and far recognition signals? Are these common to the unit SOP or have they been established for this particular operation?
  - Have emergency visual signaling techniques been established?
  - Do instructions include backup audible and visual signals for all special and emergency events?
  - What is the PACE plan and is it common to all units executing the operation?
  - Who is monitoring each element of the PACE plan?
  - Has a “sheriff’s net” or other emergency frequency been established?
  - What is the protocol for using the “sheriff’s net” and who is responsible for monitoring it?

Appendix E

Marine Corps Doctrinal Schema Conversions

This appendix provides cross-referencing for old and current Marine Corps doctrine publication numbering.

E-1. In 2016, the Marine Corps conducted a doctrine realignment project that resulted in reorganizing and renumbering its doctrinal publications. Army versions of dual-Service manuals published prior to 2016 do not reflect current Marine Corps doctrine numbering. Table E-1 reflects the number conversion. See the entire table at https://homeport.usmc.mil/sites/mcdoctrine/Shared%20Documents/Doctrine%20Hierarchy.pdf.

Table E-1. Marine Corps doctrinal manual number conversion

New Number	*Old Number*	*Publication Title*
MCRP 1-10.1	MCRP 5-12D	*Organization of the United States Marine Corps*
MCRP 2-10A.4	MCRP 2-24A	*Multi-Service Tactics, Techniques, and Procedures for Air-to-Surface Radar System Employment*
MCRP 2-10A.6	MCWP 2-25	*Ground Reconnaissance Operations*
MCRP 2-10B.1	MCRP 2-3A	*Intelligence Preparation of the Battlefield/Battlespace*
MCRP 3-01B.1	MCRP 3-11.4A	*Helicopter Rope Suspension Techniques (HRST) Operations*
MCRP 3-03A.2	MCRP 3-33.1C	*Multi-Service Techniques for Civil Affairs Support to Foreign Humanitarian Assistance*
MCRP 3-05.1	MCRP 3-02H	*Multi-Service Tactics, Techniques, and Procedures for Survival, Evasion and Recovery*
MCRP 3-10E.3	MCWP 3-16.3	*Tactics, Techniques, and Procedures for the Field Artillery Cannon Battery*
MCRP 3-20.5	MCWP 3-42.1	*Unmanned Aircraft Systems Operations*
MCRP 3-20.6	MCRP 3-42.1A	*Multi-Service Tactics, Techniques, and Procedures for the Tactical Employment of Unmanned Aircraft Systems*
MCRP 3-32D.1	MCWP 3-40.5	*Electronic Warfare*
MCRP 3-40B.2	MCRP 4-11B	*Environmental Considerations*
MCRP 3-40B.5	MCWP 4-11.6	*Petroleum and Water Logistics Operations*
MCRP 3-40D.14	MCRP 3-17.7Q	*Water Support Operations*
MCRP 3-40E.1	MCRP 4-11.4A	*Recovery and Battle Damage Assessment and Repair (BDAR)*
MCRP 12-10A.3	MCRP 3-35.1C	*Mountain Leader's Guide to Mountain Warfare Operations*
MCTP 2-10B	MCWP 2-3	*MAGTF Intelligence Production and Analysis*
MCTP 2-10C	MCWP 2-4	*Marine Air-Ground Task Force Intelligence Dissemination*
MCTP 3-01A	MCWP 3-11.3	*Scouting and Patrolling*
MCTP 3-01B	MCWP 3-11.4	*Air Assault Operations*
MCTP 3-10E	MCWP 3-16.1	*Artillery Operations*
MCTP 3-34A	MCWP 3-17.8	*Combined Arms Mobility Operations*
MCTP 3-40E	MCWP 4-11.4	*Maintenance Operations*
MCWP 2-10	MCWP 2-1	*Intelligence Operations*
MCWP 3-20	MCWP 3-2	*Aviation Operations*

Table E-1. Marine Corps doctrinal manual number conversion (*continued*)

New Number	*Old Number*	*Publication Title*
MCWP 3-32	MCWP 3-40.4	*Marine Air-Ground Task Force Information Operations*
MCWP 5-10	MCWP 5-1	*Marine Corps Planning Process*
MCWP 6-10	MCWP 6-11	*Leading Marines*

Source Notes

This division lists sources by figure number.

Figure 1-2

Photo by Sergeant Audrey Rampton, 31st Marine Expeditionary Unit, *31st Marine Expeditionary Unit Conducts Training at Jungle Warfare Training Center*, taken at Camp Gonsalves, Okinawa, Japan, 20 December 2019. Available at https://www.dvidshub.net/image/6017194/31st-marine-expeditionary-unit-conducts-training-jungle-warfare-training-center.

Figure 1-3

Photo by Corporal Eric Tso, 3rd Marine Expeditionary Force, *Bougainville Exercise*, taken at Schofield Barracks, Hawaii on 27 February 2020. Available at https://www.dvidshub.net/image/6119684/3-3-bougainville-exercise.

Figure 1-4

Photo by Technical Sergeant Brian Kimball, United States Africa Command, *Central Accord 2016*, taken at Libreville, Gabon on 17 June 2016. Available at https://www.dvidshub.net/image/2672718/central-accord-2016.

Figure B-1

Photos by Combined Arms Doctrine Directorate staff, taken at Fort Leavenworth Kansas, 10 June 2020.

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Glossary

The glossary lists acronyms and terms with Army, Marine Corps, and joint definitions. Where the same term has different definitions used by the Army, Marine Corps, or joint, then parenthesis with applicable proponent precedes the given definition. The proponent publication for terms is listed in parentheses after the definition. Approved Marine Corps acronyms, terms, definitions, and addendums can be found in MCRP 1-10.2, *Marine Corps Supplement to the Department of Defense Dictionary of Military and Associated Terms*.

SECTION I – ACRONYMS AND ABBREVIATIONS

AAV	amphibious assault vehicle
ACV	amphibious combat vehicle
ADP	Army doctrine publication
AO	area of operations
ASR	alternate supply route
ATP	Army techniques publication
BDAR	battle damage assessment and repair
CAS	close air support
CBRN	chemical, biological, radiological, and nuclear
CMOC	civil-military operations center
COMSEC	communications security
DOD	Department of Defense
DODD	Department of Defense directive
EA	engagement area
EMS	electromagnetic spectrum
EW	electronic warfare
FASCAM	family of scatterable mines
FM	field manual
FPL	final protective line
FSCM	fire support coordination measure
HN	host-nation
HUMINT	human intelligence
IED	improvised explosive device
IGO	intergovernmental organization
IO	information operations
IPB	intelligence preparation of the battlefield/battlespace
IR	infrared
JFC	joint force commander

JP	joint publication
LOC	line of communications
MAGTF	Marine air-ground task force
MCDP	Marine Corps doctrinal publication
MCOO	modified combined obstacle overlay
MCPP	Marine Corps planning process
MCRP	Marine Corps reference publication
MCTP	Marine Corps tactical publication
MCWP	Marine Corps warfighting publication
MDMP	military decision-making process
METT-T	mission, enemy, terrain and weather, troops and support available—time available
METT-TC	mission, enemy, terrain and weather, troops and support available—time available and civil considerations
MILDEC	military deception
MISO	military information support operations
MOE	measure of effectiveness
MOP	measure of performance
MOPP	mission-oriented protective posture
MSR	main supply route
NGO	nongovernmental organization
NVD	night vision device
OPSEC	operations security
PAA	position area for artillery
PRC	personnel and resource control
ROE	rules of engagement
SOF	special operations forces
SOP	standard operating procedure
SWEAT-MSO	sewer, water, electricity, academics, trash, medical, safety, other considerations
TM	technical manual
UAS	unmanned aircraft systems
U.S.	United States
WBGT	wet bulb-globe temperature

SECTION II – TERMS

air assault

(joint) The movement of friendly assault forces by rotary-wing or tiltrotor aircraft to engage and destroy enemy forces or to seize and hold key terrain. (JP 3-18) (Marine Corps amplification) Operations in which air assault forces (combat, combat support, and combat service support), using the firepower, mobility, and total integration of assault support assets in their ground or air roles, maneuver on the battlefield under the control of the mission commander to provide mobility and firepower of the assigned mission. (MCRP 1-10.2)

alternate position

(Army) A defensive position that the commander assigns to a unit or weapon for occupation when the primary position becomes untenable or unsuitable for carrying out the assigned task. (ADP 3-90) (Marine Corps) A position to be occupied when the primary position becomes untenable or unsuitable for carrying out its task. Its position allows fulfillment of the original task. (MCRP 1-10.2)

ambush

(Army) An attack by fire or other destructive means from concealed positions on a moving or temporarily halted enemy. (FM 3-90-1) (Marine Corps) A surprise attack by fire from concealed positions on a moving or temporarily halted enemy. (MCRP 1-10.2)

amphibious operation

A amphibious operation is a military operation launched from the sea by an amphibious force to conduct landing force operations within the littorals. (JP 3-02)

area defense

(Army) A type of defensive operation that concentrates on denying enemy forces access to designated terrain for a specific time rather than destroying the enemy outright. (ADP 3-90) (Marine Corps) A type of defense in which the bulk of the defending force is disposed in selected tactical localities where the decisive battle is to be fought. Principal reliance is placed on the ability of the forces in the defended localities to maintain their positions and to control the terrain between them. The reserve is used to add depth, to block, or restore the battle position by counterattack. (MCRP 1-10.2)

area security

A type of security operation conducted to protect friendly forces, lines of communications, and activities within a specific area. (ADP 3-90)

attack

A type of offensive operation that destroys or defeats enemy forces, seizes and secures terrain, or both. (ADP 3-90) (Marine Corps) An offensive action characterized by coordinated movement, supported by fire, conducted to defeat, destroy, or capture the enemy or seize and/or secure key terrain. (MCRP 1-10.2)

battle position

(Army) A defensive location oriented on a likely enemy avenue of approach. (ADP 3-90) (Marine Corps) In ground operations, a defensive location oriented on an enemy avenue of approach from which a unit may defend. (MCRP 1-10.2)

biological agent

A microorganism (or a toxin derived from it) that causes disease in personnel, plants, or animals or causes the deterioration of materiel. (JP 3-11)

biometrics

The process of recognizing an individual based on measurable anatomical, physiological, and behavioral characteristics. (JP 2-0)

breakout

(Army) An operation conducted by an encircled force to regain freedom of movement or contact with friendly units. (ADP 3-90) (Marine Corps) An operation conducted by an encircled force to regain freedom of movement or contact with friendly units. It differs from other attacks only in that a simultaneous defense in other areas of the perimeter must be maintained. (MCRP 1-10.2)

chemical, biological, radiological, and nuclear operations

Chemical, biological, radiological, and nuclear operations include the employment of capabilities that assess, protect against, and mitigate the entire range of chemical, biological, radiological, and nuclear incidents to enable freedom of action. (FM 3-11)

close area

The portion of the commander's area of operations where the majority of subordinate maneuver forces conduct close combat. (ADP 3-0)

combat power

(joint) The total means of destructive and/or disruptive force that a military unit/formation can apply against the opponent at a given time (JP 3-0). (Army) The total means of destructive, constructive, and information capabilities that a military unit or formation can apply at a given time. (ADP 3-0) (Marine Corps) The total destructive force we can bring to bear against the enemy; it is a unique product of a variety of physical, moral, and mental factors. (MCDP 1-3)

command and control

The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. (JP 1) (Marines Corps amplification) The means by which a commander recognizes what needs to be done and sees to it that appropriate actions are taken. Command and control is one of the warfighting functions. (MCRP 1-10.2)

command and control system

(Army) The arrangement of people, processes, networks, and command posts that enable commanders to conduct operations. (ADP 6-0)

command and control warfighting function

The related tasks and a system that enable commanders to synchronize and converge all elements of combat power. (ADP 3-0)

command post

(Army) A unit headquarters where the commander and staff perform their activities. (FM 6-0) (Marine Corps) A unit's or subunit's headquarters where the commander or designated representative and the staff perform their activities. (MCRP 1-10.2)

confirmation brief

A brief subordinate leaders give to the higher commander immediately after the operation order is given to confirm understanding. (ADP 5-0)

consolidate gains

Activities to make enduring any temporary operational success and to set the conditions for a sustainable security environment, allowing for a transition of control to other legitimate authorities. (ADP 3-0)

consolidation area

The portion of the land commander's area of operations that may be designated to facilitate freedom of action, consolidate gains through decisive action, and set conditions to transition the area of operations to follow on forces or other legitimate authorities. (ADP 3-0)

control

(Army) The regulation of forces and warfighting functions to accomplish the mission in accordance with the commander's intent. (ADP 6-0) (Marine Corps) To maintain physical influence by occupation or range of weapon systems over the activities or access in a defined area. (MCRP 1-10.2)

critical asset list

A prioritized list of assets or areas, normally identified by phase of the operation and approved by the joint force commander that should be defended against air and missile threats. (JP 3-01)

culminating point

The point at which a force no longer has the capability to continue its form of operations, offense or defense. (JP 5-0)

cyberspace

A global domain within the information environment consisting of the interdependent networks of information technology infrastructures and resident data, including the Internet, telecommunications networks, computer systems, and embedded processors and controllers. (JP 3-12)

decisive operation

The operation that directly accomplishes the mission. (ADP 3-0)

decontamination

The process of making any person, object, or area safe by destroying, neutralizing, making harmless, or absorbing and removing chemical or biological agents or by removing radioactive material clinging to or around it. (JP 3-11)

deep area

Where the commander sets conditions for future success in close combat. (ADP 3-0)

defended asset list

A listing of those assets from the critical asset list prioritized by the joint force commander to be defended with the resources available. (JP 3-01)

defensive operation

(Army) An operation to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive or stability operations. (ADP 3-0) (Marine Corps) Operations conducted to defeat an enemy attack, gain time, economize forces, and develop conditions favorable to offensive and stability operations. The three types of defensive operations are area, mobile, and retrograde. (MCRP 1-10.2)

delay

(Army) When a force under pressure trades space for time by slowing down the enemy's momentum and inflicting maximum damage on enemy forces without becoming decisively engaged. (ADP 3-90) (Marine Corps) A form of retrograde in which a force under pressure trades space for time by slowing the enemy's momentum and inflicting maximum damage on the enemy without, in principle, becoming decisively engaged. (MCRP 1-10.2)

delay line

A phase line where the date and time before which the enemy is not allowed to cross the phase line is depicted as part of the graphic control measure. (FM 3-90-1)

disengagement line

A phase line located on identifiable terrain that, when crossed by the enemy, signals to defending elements that it is time to displace to their next position. (ADP 3-90)

engagement area

(Army) An area where the commander intends to contain and destroy an enemy force with the massed effects of all available weapons and supporting systems. (ADP 3-90) (Marine Corps) An area where the commander intends to contain and destroy an enemy force with the effects of massed weapons and supporting systems. (MCRP 1-10.2)

exfiltrate

A tactical mission task where a commander removes Soldiers or units from areas under enemy control by stealth, deception, surprise, or clandestine means. (FM 3-90-1)

exploitation

(Army) A type of offensive operation that usually follows a successful attack and is designed to disorganize the enemy in depth. (ADP 3-90) (joint) An offensive operation that usually follows a successful attack and is designed to disorganize the enemy in depth. (JP 2-01.3) (Marine Corps amplification) An offensive operation following a successful attack that is designed to disorganize the enemy in depth. It extends the initial success of the attack by preventing the enemy from disengaging, withdrawing, and reestablishing an effective defense. (MCRP 1-10.2)

final protective fire

An immediately available prearranged barrier of fire designed to impede enemy movement across defensive lines or areas. (JP 3-09.3)

fires

The use of weapon systems or other actions to create specific lethal or nonlethal effects on a target. (JP 3-0) (Marine Corps amplification) Those means used to delay, disrupt, degrade, or destroy enemy capabilities, forces, or facilities as well as affect the enemy's will to fight. Fires is one of the warfighting functions. (MCRP 1-10.2)

fires warfighting function

The related tasks and systems that create and converge effects in all domains against the adversary or enemy to enable operations across the range of military operations. (ADP 3-0)

force protection

(joint) Preventive measures taken to mitigate hostile actions against Department of Defense personnel (to include family members), resources, facilities, and critical information. (JP 3-0) (Marine Corps amplification) Actions or effects used to safeguard own centers of gravity while protecting, concealing, reducing, or eliminating friendly critical vulnerabilities. Force protection is one of the warfighting functions. (MCRP 1-10.2)

force tailoring

The process of determining the right mix of forces and the sequence of their deployment in support of a joint force commander. (ADP 3-0)

forms of maneuver

Distinct tactical combinations of fire and movement with a unique set of doctrinal characteristics that differ primarily in the relationship between the maneuvering force and the enemy. (ADP 3-90)

fratricide

The unintentional killing or wounding of friendly or neutral personnel by friendly firepower. (ADP 3-37)

high-payoff target

A target whose loss to the enemy will significantly contribute to the success of the friendly course of action. (JP 3-60)

high-value target

A target the enemy commander requires for the successful completion of the mission. (JP 3-60)

infiltration

(Army) A form of maneuver in which an attacking force conducts undetected movement through or into an area occupied by enemy forces to occupy a position of advantage behind those enemy positions while exposing only small elements to enemy defensive fires. (FM 3-90-1) (Marines Corps) The movement through or into an area or territory occupied by either friendly or enemy troops or organizations. The movement is made, either by small groups or by individuals at extended or irregular intervals. When used in connection with the enemy, it implies that contact is avoided. (MCRP 1-10.2)

information environment

The aggregate of individuals, organizations, and systems that collect, process, disseminate, or act on information. (JP 3-13)

information operations

The integrated employment, during military operations, of information-related capabilities in concert with other lines of operation to influence, disrupt, corrupt, or usurp the decision-making of adversaries and potential adversaries while protecting our own. (JP 3-13) (Marine Corps amplification) The integration, coordination, and synchronization of actions taken to affect a relevant decisionmaker in order to create an operational advantage for the commander.

intelligence

The product resulting from the collection, processing, integration, evaluation, analysis, and interpretation of available information concerning foreign nations, hostile or potentially hostile forces or elements, or areas of actual or potential operations (JP 2-0). (Marine Corps amplification) Knowledge about the enemy or the surrounding environment needed to support decision-making. Intelligence is one of the warfighting functions. (MCRP 1-10.2)

intelligence preparation of the battlefield/battlespace

(Army) The systematic process of analyzing the mission variables of enemy, terrain, weather, and civil considerations in an area of interest to determine their effect on operations. (ATP 2-01.3) (joint) The analytical methodologies employed by the Services or joint force component commands to reduce uncertainties concerning the enemy, environment, time, and terrain. (JP 2-01.3) (Marine Corps amplification) The systematic, continuous process of analyzing the threat and environment in a specific geographic area. (MCRP 1-10.2)

intelligence warfighting function

The related tasks and systems that facilitate understanding the enemy, terrain, weather, civil considerations, and other significant aspects of the operational environment. (ADP 3-0)

key terrain

(Army) An identifiable characteristic whose seizure or retention affords a marked advantage to either combatant. (ADP 3-90)

knowledge management

(Army) The process of enabling knowledge flow to enhance shared understanding, learning, and decision making. (ADP 6-0) (Marine Corps) The integration of people and processes, enabled by technology, to facilitate the exchange of operationally relevant information and expertise to increase organizational performance. (MCRP 1-10.2)

leadership

The activity of influencing people by providing purpose, direction, and motivation to accomplish the mission and improve the organization. (ADP 6-22)

logistics

(joint) Planning and executing the movement and support of forces. (JP 4-0) (Marine Corps amplification) All activities required to move and sustain military forces. Logistics is one of the warfighting functions. (MCRP 1-10.2)

main battle area

(Army) The area where the commander intends to deploy the bulk of the unit's combat power and conduct decisive operations to defeat an attacking enemy. (ADP 3-90) (Marine Corps) That portion of the battlespace in which the commander conducts close operations to defeat the enemy. Normally, the main battle area extends rearward from the forward edge of the battle area to the rear boundary of the command's subordinate units. (MCRP 1-10.2)

main effort

A designated subordinate unit whose mission at a given point in time is most critical to overall mission success. (ADP 3-0) It is usually weighted with the preponderance of combat power and is directed against a center of gravity through a critical vulnerability. (MCDP 1-01.2)

maneuver

Employment of forces in the operational area, through movement in combination with fires and information, to achieve a position of advantage in respect to the enemy. (JP 3-0) (Marine Corps amplification) The movement of forces for the purpose of gaining an advantage over the enemy. Maneuver is one of the warfighting functions. (MCRP 1-10.2)

measure of effectiveness

An indicator used to measure a current system state, with change indicated by comparing multiple observations over time. (JP 5-0)

measure of performance

An indicator used to measure a friendly action that is tied to measuring task accomplishment. (JP 5-0)

military decision-making process

An iterative planning methodology to understand the situation and mission, develop a course of action, and produce an operation plan or order. (ADP 5-0)

mission command

(Army) The Army's approach to command and control that empowers subordinate decision making and decentralized execution appropriate to the situation. (ADP 6-0)

mobile defense

(Army) A type of defensive operation that concentrates on the destruction or defeat of the enemy through a decisive attack by a striking force. (ADP 3-90) (Marine Corps) Defense of an area or position in which maneuver is used with organization of fire and utilization of terrain to seize the initiative from the enemy. (MCRP 1-10.2)

modified combined obstacle overlay

A joint intelligence preparation of the operational environment product used to portray the militarily significant aspects of the operational environment, such as obstacles restricting military movement, key geography, and military objectives. (JP 2-01.3)

movement and maneuver warfighting function

The related tasks and systems that move and employ forces to achieve a position of relative advantage over the enemy and other threats. (ADP 3-0)

movement to contact

A type of offensive operation designed to develop the situation and establish or regain contact. (ADP 3-90)

mutual support

That support which units render each other against an enemy because of their assigned tasks, their position relative to each other and to the enemy, and their inherent capabilities. (JP 3-31)

objective rally point

An easily identifiable point where all elements of the infiltrating unit assemble and prepare to attack the objective. (ADP 3-90)

obscuration

(Army) The employment of materials into the environment that degrade optical and/or electro-optical capabilities within select portions of the electromagnetic spectrum in order to deny acquisition by or deceive an enemy or adversary. (ATP 3-11.50) (Marine Corps) The effects of weather, battlefield dust, and debris, or the use of smoke munitions to hamper observation and target-acquisition capability or to conceal activities or movement. (MCRP 1-10.2)

operations in depth

The simultaneous application of combat power throughout an area of operations. (ADP 3-90)

penetration

A form of maneuver in which an attacking force seeks to rupture enemy defenses on a narrow front to disrupt the defensive system. (FM 3-90-1)

preparation fire

Normally a high volume of fires delivered over a short period of time to maximize surprise and shock effect. Preparation fire include electronic attack and should be synchronized with other electronic warfare activities. (FM 3-09)

primary position

(Army) The position that covers the enemy's most likely avenue of approach into the area of operations. (ADP 3-90) (Marine Corps) A position that provides the best means to accomplish the assigned mission. (MCRP 1-10.2)

protection

Preservation of the effectiveness and survivability of mission-related military and nonmilitary personnel, equipment, facilities, information, and infrastructure deployed or located within or outside the boundaries of a given operational area. (JP 3-0)

protection warfighting function

The related tasks and systems that preserve the force so the commander can apply maximum combat power to accomplish the mission. (ADP 3-0)

pursuit

A type of offensive operation designed to catch or cut off a hostile force attempting to escape, with the aim of destroying it. (ADP 3-90) (Marine Corps) An offensive operation designed to catch or cut off a hostile force attempting to escape, with the aim of destroying it. (MCRP 1-10.2)

raid

(joint) An operation to temporarily seize an area to secure information, confuse an enemy, capture personnel or equipment, or to destroy a capability culminating with a planned withdrawal. (JP 3-0) (Marine Corps amplification) An attack, usually small scale, involving a penetration of hostile territory for a specific purpose other than seizing and holding terrain. It ends with a planned withdrawal upon completion of the assigned mission (MCRP 1-10.2).

reconnaissance

A mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or adversary, or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area. (JP 2-0)

reconnaissance in force

(Army) A type of reconnaissance operation designed to discover or test the enemy's strength, dispositions, and reactions or to obtain other information. (ADP 3-90) (Marine Corps) A deliberate attack made to obtain information and to locate and test enemy dispositions, strengths, and reactions. It is used when knowledge of the enemy is vague and there is insufficient time or resources to develop the situation. (MCRP 1-10.2)

reduce

A tactical mission task that involves the destruction of an encircled or bypassed enemy force. (FM 3-90-1)

retain

(Army) A tactical mission task in which the commander ensures that a terrain feature controlled by a friendly force remains free of enemy occupation or use. (FM 3-90-1) (Marine Corps) To occupy and hold a terrain feature to ensure it is free of enemy occupation or use. (MCRP 1-10.2)

retirement

(Army) When a force out of contact moves away from the enemy. (ADP 3-90) (Marine Corps) An operation in which a force out of contact moves away from the enemy. (MCRP 1-10.2)

retrograde

(Army) A type of defensive operation that involves organized movement away from the enemy. (ADP 3-90) (joint) The process for the movement of non-unit equipment and materiel from a forward location to a reset (replenishment, repair, or recapitalization) program or to another directed area of operations to replenish unit stocks, or to satisfy stock requirements. (JP 4-09) (Marine Corps amplification) Any movement or maneuver of a command to the rear, or away from the enemy. (MCRP 1-10.2)

risk management

The process to identify, assess, and control risks and make decisions that balance risk cost with mission benefits. (JP 3-0) (Marine Corps amplification) The five steps of risk management are identify the hazards, assess the hazards, develop controls and make risk decision, implement controls, and supervise and evaluate. (MCRP 1-10.2)

secure

(Army) A tactical mission task that involves preventing a unit, facility, or geographical location from being damaged or destroyed as a result of enemy action. (FM 3-90-1) (Marine Corps) To gain possession of a position, terrain feature, piece of infrastructure, or civil asset, with or without force, and prevent its destruction or loss by enemy action. The attacking force may or may not have to physically occupy the area. (MCDP 1-0)

security area

(Army) That area that occupied by a unit's security elements and includes the areas of influence of those security elements. (ADP 3-90) (Marine Corps) The area that begins at the forward edge of the battle area and extends as far to the front and flanks as security forces are deployed, normally to the forward boundary of the area of operations. Forces in the security area conduct reconnaissance to furnish information on the enemy and to delay, deceive, and disrupt the enemy. (MCRP 1-10.2)

security cooperation

All Department of Defense interactions with foreign security establishments to build security relationships that promote specific United States security interests, develop allied and partner nation military and security capabilities for self-defense and multinational operations, and provide United States forces with peacetime and contingency access to allied and partner nations. (JP 3-20)

security operations

Those operations performed by commanders to provide early and accurate warning of enemy operations, to provide the forces being protected with time and maneuver space within which to react to the enemy, and to develop the situation to allow commanders to effectively use their protected forces. (ADP 3-90)

shaping operation

An operation at any echelon that creates and preserves conditions for success of the decisive operation through effects on the enemy, other actors, and the terrain. (ADP 3-0)

situation template

(joint) A depiction of assumed adversary dispositions, based on that adversary's preferred method of operations and the impact of the operational environment if the adversary should adopt a particular course of action. (JP 2-01.3) (Marine Corps amplification) A series of projections that portray, based on enemy doctrine, the most probable disposition and location of enemy forces within constraints imposed by weather and terrain. (MCRP 1-10.2)

space domain

The area above the altitude where atmospheric effects on airborne objects become negligible. (JP 3-14)

stability operation

An operation conducted outside the United States in coordination with other instruments of national power to establish or maintain a secure environment and provide essential governmental services, emergency infrastructure reconstruction, and humanitarian relief. (ADP 3-0)

striking force

A dedicated counterattack force in a mobile defense constituted with the bulk of available combat power. (ADP 3-90)

strong point

(Army) A heavily fortified battle position tied to a natural or reinforcing obstacle to create an anchor for the defense or to deny the enemy decisive or key terrain. (ADP 3-90) (Marine Corps) A key point in a defensive position, usually strongly fortified and heavily armed with automatic weapons, around which other positions are grouped for its protection. (MCRP 1-10.2)

subsequent position

A position that a unit expects to move to during the course of battle. (ADP 3-90)

supplementary position

(Army) A defensive position located within a unit's assigned area of operations that provides the best sectors of fire and defensive terrain along an avenue of approach that is not the primary avenue where the enemy is expected to attack. (ADP 3-90) (Marine Corps) A position that provides the best means to accomplish a task that cannot be accomplished from the primary or alternate position. (MCRP 1-10.2)

support area

The portion of the commander's area of operations that is designated to facilitate the positioning, employment, and protection of base sustainment assets required to sustain, enable, and control operations. (ADP 3-0)

support by fire

(Army) A tactical mission task in which a maneuver force moves to a position where it can engage the enemy by direct fire in support of another maneuvering force. (FM 3-90-1) (Marine Corps) To engage the enemy by direct fire to support a maneuvering force using overwatch or by establishing a base of fire. The supporting force does not capture enemy forces or terrain. (MCRP 1-10.2)

supporting distance

(Army) The distance between two units that can be traveled in time for one to come to the aid of the other and prevent its defeat by an enemy or ensure it regains control of a civil situation. (ADP 3-0) (Marine Corps) The distance between two units that can be traveled in time for one to come to the aid of the other. (MCRP 1-10.2)

supporting effort

(Army) A designated subordinate unit with a mission that supports the success of the main effort. (ADP 3-0) (Marine Corps) Designated subordinate unit(s) whose mission is designed to directly contribute to the success of the main effort. (MCRP 1-10.2)

supporting range

(Army) The distance one unit may be geographically separated from a second unit yet remain within the maximum range of the second unit's weapons systems. (ADP 3-0) (Marine Corps) The distance one unit may be geographically separated from a second unit yet remain within the maximum range of the second unit's weapons systems. (MCRP 1-10.2)

suppress

(Army) A tactical mission task that results in the temporary degradation of the performance of a force or weapon system below the level needed to accomplish its mission. (FM 3-90-1)

surveillance

The systematic observation of aerospace, cyberspace, surface, or subsurface areas, places, persons, or things by visual, aural, electronic, photographic, or other means. (JP 3-0) (Marine Corps amplification) The systematic visual or aural observation of an enemy force or named area of interest or an area and the activities in it to collect intelligence required to confirm or deny enemy/adversary courses of action or identify enemy/adversary critical vulnerabilities and limitations. (MCRP 1-10.2)

survivability

(Army/Marine Corps) A quality or capability of military forces which permits them to avoid or withstand hostile actions or environmental conditions while retaining the ability to fulfill their primary mission. (ATP 3-37.34/MCTP 3-34C) (joint) All aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy. (JP 3-34) (Marine Corps amplification) The degree to which a system is able to avoid or withstand a man-made hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission. (MCRP 1-10.2)

survivability operations

Those protection activities that alter the physical environment by providing or improving cover, camouflage, and concealment. (ATP 3-37.34/MCTP 3-34C)

sustaining operation

An operation at any echelon that enables the decisive operation or shaping operations by generating and maintaining combat power. (ADP 3-0)

sustainment warfighting function

The related tasks and systems that provide support and services to ensure freedom of action, extended operational reach, and prolong endurance. (ADP 3-0)

tactical combat force

A rapidly deployable, air-ground, mobile combat unit with appropriate combat support and combat service support assets assigned to, and capable of, defeating Level III threats, including combined arms. (JP 3-10)

targeting

The process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities. (JP 3-0)

target reference point

A predetermined point of reference, normally a permanent structure or terrain feature that can be used when describing a target location (JP 3-09.3) (Marine Corps amplification) An easily recognizable point on the ground (either natural or man-made) used to initiate, distribute, and control fires. (MCRP 1-10.2)

tempo

The relative speed and rhythm of military operations over time with respect to the enemy. (ADP 3-0 and MCRP 1-10.2)

turning movement

(Army) A form of maneuver in which the attacking force seeks to avoid the enemy's principle defensive positions by seizing objectives behind the enemy's current positions thereby causing the enemy force to move out of their current positions or divert major forces to meet the threat. (FM 3-90-1)

warfighting function

A group of tasks and systems united by a common purpose that commanders use to accomplish missions and training objectives. (ADP 3-0)

withdraw

To disengage from an enemy force and move in a direction away from the enemy. (ADP 3-90)

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This page intentionally left blank.

Index

Entries are by paragraph number.

A

air and missile defense, 3-121–3-124
 active measures, 7-24
 passive measures, 7-23
air assault, 3-55, 4-23, 4-46, 4-47, 4-61, 5-12
airborne operations, 3-55
ambush, 4-37–4-40
 defense against, 4-41–4-43
amphibious combat vehicle, 2-81
amphibious operation, 3-56
area defense, 5-24–5-33
area security, 4-93–4-95
armor, 2-70–2-71
 in the defense, 5-93
 restrictions in jungle, 2-72
 tips for movement, 2-74
amphibious assault vehicle, 2-81
attack, 4-26–4-31
attack point method, A-13
avenues of approach, 1-34–1-39, 5-42, 5-77–5-78

B

batteries, 1-131
battery defense, 3-140–3-141
battle damage assessment and repair, 3-161
battle positions, 5-17, 5-24, 5-26
 during delay, 5-43
 movement between, 5-47–5-48
 types, 5-42
 USMC definition, 5-77
biological weapons, 3-248–3-253
biometrics, 3-98
Bradley fighting vehicle, 2-78

C

camouflage, 3-224–3-233
casualty, 3-26–3-27
 evacuation, 3-183–3-184, 4-77
chemical weapons, 3-244–3-247
chemical, biological, radiological, and nuclear operations, 3-239–3-260
 defense, 5-116
 training, 7-12
 weather effects on, 3-241–3-242
civil control, 6-13–6-15
civil security, 6-3, 6-9–6-10
civil-military operations, 3-90–3-91, 6-31, 6-37–6-38
civil-military operations center, 3-90–3-91, 6-31, 6-37–6-38, 6-44
classes of supply, 3-190–3-197, 6-49
coherent change, 7-76
cold, 1-112
collateral damage, 3-28–3-29
combat load, C1-C-13
combat power, 2-84–2-85, 3-1–3-2, 3-198–3-199
combined arms, 2-66–2-69, 3-24
command and control warfighting function, 3-12–3-13, 4-65–4-67, 5-87–5-90, 6-31–6-41
command post, 3-49–3-50
consolidate gains, 4-80–4-89, 4-92–4-95
consolidation area, 2-15, 4-90–4-91
control measures, 2-11, 2-76, 4-28
 and fratricide prevention, D-6–D-8, D-15
 during infiltration, 4-52
 in the defense, 5-43–5-45
 indirect fire, 5-31
counterattack, 4-44
countermobility, 3-68–3-72, 5-95–5-96
counterreconnaissance, 5-22
cover and concealment, 1-16–1-17, 3-26, 3-205, 3-224
critical asset list, 3-121, 3-200, 6-57
cyberspace, 2-5, 2-17, 2-23, 2-30–2-35

D

defended asset list, 3-121, 3-200, 6-57
defending encircled, 5-56–5-62
defense, characteristics of, 5-8–5-22
 types of operations, 5-23–5-55
dehydration, 1-84–1-95
 prevention, 1-93–1-95
 symptoms and effects of, 1-87–1-92
delay, 5-39–5-49
diet, 1-118
disease, 1-115–1-116
disengagement line, 5-44
dismounted infantry, 2-73, 3-24
distribution operations, 3-162–3-174

E

economy of force, 2-84–2-85, 5-16, 6-10
electromagnetic spectrum, 2-30–2-35, 3-261, 3-269–3-270
electronic warfare, 2-35, 4-74
engagement area, 5-29
environmental effects, on equipment, 1-129–1-136
 on personnel, 1-63–1-127
exfiltration, 5-61–5-62
exploitation, 4-45–4-46

F

family of scatterable mines, 3-71
field artillery, 3-109–3-110
 in the defense, 5-102–5-105
final protective fire, 5-31, 5-67
final protective line, 5-31

Entries are by paragraph number.

fire support, 3-100
  acquisition and engagement ranges, 3-126–3-130
  mobility, 3-138
  munitions, 3-133–3-136
  observation, 3-137
  positioning, 3-131–3-132
  registration, 3-139
fire support coordination measures, 5-31, 5-67, 6-47, D-6, D-15
fires warfighting function, 3-100, 4-72–4-75, 5-100–5-105
force protection, 3-198
force tailoring, 3-23–3-24
forms of maneuver, 4-48–4-61
forms of the defense, 5-63–5-79
fortified positions, 4-29
fratricide, 3-30–3-31, 3-39, D-1–D-17
frontal assault, 4-49–4-50
fundamentals, 2-40–2-88

G

gap crossing, 3-63

H

health considerations, 115–116, 3-181–3-184
heat cramps, 1-71
heat exhaustion, 1-72
heat injuries, 1-67–1-83
  prevention, 1-75–1-83
heat rash, 1-70
heat stroke, 1-73
humanitarian assistance, 6-11–6-12
hygiene, 1-117

I

indirect fire, adjust by sound, 3-142–3-148
infiltration, 4-51–4-60
  control measures, 4-52
  lanes, 4-56–4-57
information, 3-8
information collection, 3-18–3-19
information environment, 2-27–2-29
information warfighting function, 3-9–3-11, 4-64, 5-86, 6-29–6-30
intelligence, 2-50–2-54
intelligence preparation of the battlefield/battlespace, 3-17
intelligence warfighting function, 3-77–3-99, 4-71, 5-99, 6-44–6-46

J

joint operations, 2-36–2-39
jungle, types of, 1-3–1-17
jungle terrain, 1-22–1-47

K

key terrain, 1-40–1-41, 2-83–2-85, 5-6
knowledge management, 3-33–3-34

L

latrine, 1-119
leadership, 3-3–3-7
light armored vehicle, 2-82
linear defense, 5-72–5-74
linkup, 4-52, 5-61–5-62
logistics, 2-79, 3-149–3-155, 4-16, 4-76

M

main and supporting effort, 2-20–2-22
main battle area, 5-17, 5-30, 5-91, 5-101
maintenance, 1-130–1-131, 1-136, 3-156–3-160
Marine air-ground task forces, 3-25
Marine Corps planning process, 3-16
measures of effectiveness, 6-32–6-33
measures of performance, 6-32–6-33
mechanized infantry, 2-75–2-80
medical training, 7-16
military deception, 4-64, 5-86, 5-97, 5-113
military decision-making process, 3-15
military information support group, 3-8
military police, 3-238, 3-275
mission command, 3-12
mission variables, 3-17, 3-125, 3-133, 3-265, 4-9, 4-52
mission-oriented protective posture, 3-264–3-266
mobile defense, 5-34–5-37
mobility, 2-40, 2-69–2-70, 3-52–3-54, 3-84
mobility corridors, 3-17
mortars, 3-107–3-108
mortuary affairs, 3-185–3-187
movement, 3-55–3-67
  during limited visibility, A-17–A-19
  jungle techniques, 3-64–3-67
movement and maneuver, 3-73–3-76
movement and maneuver/maneuver warfighting function, 3-51, 4-68–4-70, 5-91–5-98, 6-42–6-43
movement to contact, 2-75, 4-19–4-25
multiple launch rocket system, 3-115–3-117
mutual support, 4-8, 4-14
  in the defense, 5-42, 5-66, 5-104

N

naval gunfire, 3-111–3-114
noncombatants, 2-86–2-88
nongovernmental organization, 3-47, 3-90–3-91, 6-4, 6-27, 6-37
nuclear weapons, 3-254–3-257

O

objective rally point, 4-52, C-8
obscuration, 3-261–3-263
observation and fields of fire, 1-24–1-33
obstacles, 1-42–1-44
offense, characteristics of, 4-11–4-17
  types of operations, 4-18–4-47
offset method, A-12
operational framework, 2-4–2-22
operational variables, 2-3
operations in depth, 5-17–5-18

P–Q

perimeter defense, 5-64–5-71
  Y-shaped, 5-70–5-71
population and resource control, 5-121

Entries are by paragraph number.

position area artillery, 5-102–5-103
preparation fire, 4-74
preventive medicine, 1-115–1-116, 3-181, 6-53
  training, 7-16
protection/force protection warfighting function, 3-198–3-278, 4-79, 5-6, 5-21, 5-110–5-121, 6-51–6-57
pursuit, 4-47

R

radar, ground surveillance, 2-64
radio communication, 3-44–3-48
raid, 4-32–4-36
rear area security, 4-94
recognition signals, 3-38–3-41, 4-52, 5-32, 5-45, 5-117
reconnaissance, 2-55–2-59
reconnaissance by fire, 2-62
reconnaissance in force, 2-60–2-61
resection, A-9–A-10
reserve, 5-11–5-12, 5-15–5-16, 5-24, 5-33
retirement, 5-54–5-55
retrograde, 5-38
reverse slope defense, 5-75–5-76
risk management, 3-21
risk reduction control measures, 3-32

S

sector, 5-79
security, 5-117
  active measures, 5-120
  passive measures, 5-118–5-119
security area, 5-17–5-18, 5-22, 5-30, 5-92, 5-101
security cooperation, 6-24
security operations, 5-21–5-22
space, 2-24–2-26
stability operations tasks, 4-87, 4-92, 6-7–6-24
striking force, 5-34, 5-36–5-37, 5-40, 5-74, 5-82
strong point, 5-78
Stryker, 2-82
supply routes, 3-271–3-278
support area, 2-14
supporting distance, 4-8, 4-15, 4-55, 5-104
supporting range, 4-8, 4-14, 5-26, 5-104
surveillance, 2-63
survivability operations, 3-205–3-233
survivability positions, 3-207–3-223
sustainment/logistics, 2-14, 3-23
  planning for, 3-175–3-180
sustainment warfighting function, 3-149–3-155, 4-76–4-78, 5-107

T

tactical combat force, 3-278, 5-111–5-112
targeting, 3-20, 3-102–3-106
tracking, A-20–A-22
  techniques to defeat, A-24
transition, to civil authority, 6-25–6-27
  to stability operations, 4-80–4-89
  to the offense, 5-81–5-82
  to the retrograde, 5-83–5-84
turning movement, 4-61

U

uniform, 1-137–1-138
  modifications to, 1-81
unmanned aircraft systems, 1-26

V

vegetation, 1-46–1-47

W–X–Y–Z

water, 1-45, 1-96–1-111
  consumption, 1-79
  exposure, 1-120–1-122
  planning considerations, 1-104–1-106
  requirements, 1-107–1-111
  storage techniques, 1-96–1-103
water survival training, 7-9
wet bulb-globe temperature index, 1-78–1-81
wildlife, 1-48–1-62
  insects, 1-49–1-56
  leeches, 1-57–1-58
  reptiles, 1-60
  snakes, 1-59
withdraw, 5-50–5-53
work/rest and water consumption, 1-79

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