Section 3

INTRODUCTION TO TERRAIN ANALYSIS

Key Points

1 Terrain Analysis

2 OAKOC

3 Terrain Classifications

4 The Effects of Weather and Light

If you take a flat map
And move wooden blocks upon it strategically,
The thing looks well, the blocks behave as they should.
The science of war is moving live men like blocks
And getting the blocks into place at a fixed moment.
But it takes time to mold your men into blocks
And flat maps turn into country, where creeks and gullies
Hamper your wooden squares. They stick in the brush,
They are tired and rest, they straggle after ripe blackberries
And you cannot lift them up in your hand and move them. . . .
It is all so clear in the maps, so clear in the mind. . . .

Stephen Vincent Benét

Introduction

terrain analysis

the collection, analysis, evaluation, and interpretation of geographic information on the natural and man-made features of the terrain, combined with other relevant factors, to predict the effect of terrain on military operations

When you're planning a military operation—whether it's a division movement or a squad patrol—you must take into account the effects of the terrain, weather, and light. The terrain includes natural and man-made features, structures, and conditions that may favor the attacker, the defender, or both.

Knowing the principles of **terrain analysis** is vital to your ability to deploy, maneuver, and advance your unit in the field. Your ability to analyze and tactically use the ground around you (and to know how your enemy can use the same ground) can transform the terrain into a valuable ally.

At Gettysburg in 1863, for example, the Union Army gained significant advantage by holding the ridges and hills south of the town, making it difficult for the Confederates to attack successfully (See map, Section 5). This reversed the two sides' roles the previous year, at Fredericksburg, Va. There, the Confederates enjoyed cover and concealment behind a stone wall bordering a sunken road along with the advantage of the heights—massacring hapless Union troops trying repeatedly to attack across an open field. At Gettysburg, one of Confederate GEN Robert E. Lee's major problems was that, his cavalry reconnaissance absent, he had very little understanding of the terrain surrounding the town. In 1864 during the Battle of the Wilderness in Virginia, however, Lee made effective use of the tangled forests to neutralize Union GEN. Ulysses S. Grant's advantage in numbers.

Carnage at Fredericksburg

In several ways, Marye's Heights [just southwest of the city] offered the Federals their most promising target. Not only did this sector of Lee's defenses lie closest to the shelter of Fredericksburg, but the ground rose less steeply here than on the surrounding hills.

Nevertheless, Union Soldiers had to leave the city, descend into a valley bisected by a water-filled canal ditch, and ascend an open slope of 400 yards to reach the base of the heights. Artillery atop Marye's Heights and nearby elevations would thoroughly blanket the Federal approach. "A chicken could not live on that field when we open on it," boasted [one] Confederate cannoneer.

[Union MG Edwin V.] Sumner's first assault began at noon and set the pattern for a ghastly series of attacks that continued, one after another, until dark. As soon as the Northerners marched out of Fredericksburg, [Confederate LTG James] Longstreet's artillery wreaked havoc on the crisp blue formations. The Unionists then encountered a deadly bottleneck at the canal ditch which was spanned by partially-destroyed bridges at only three places. Once across this obstacle, the attackers established shallow battle lines under cover of a slight bluff that shielded them from [Rebel] eyes.

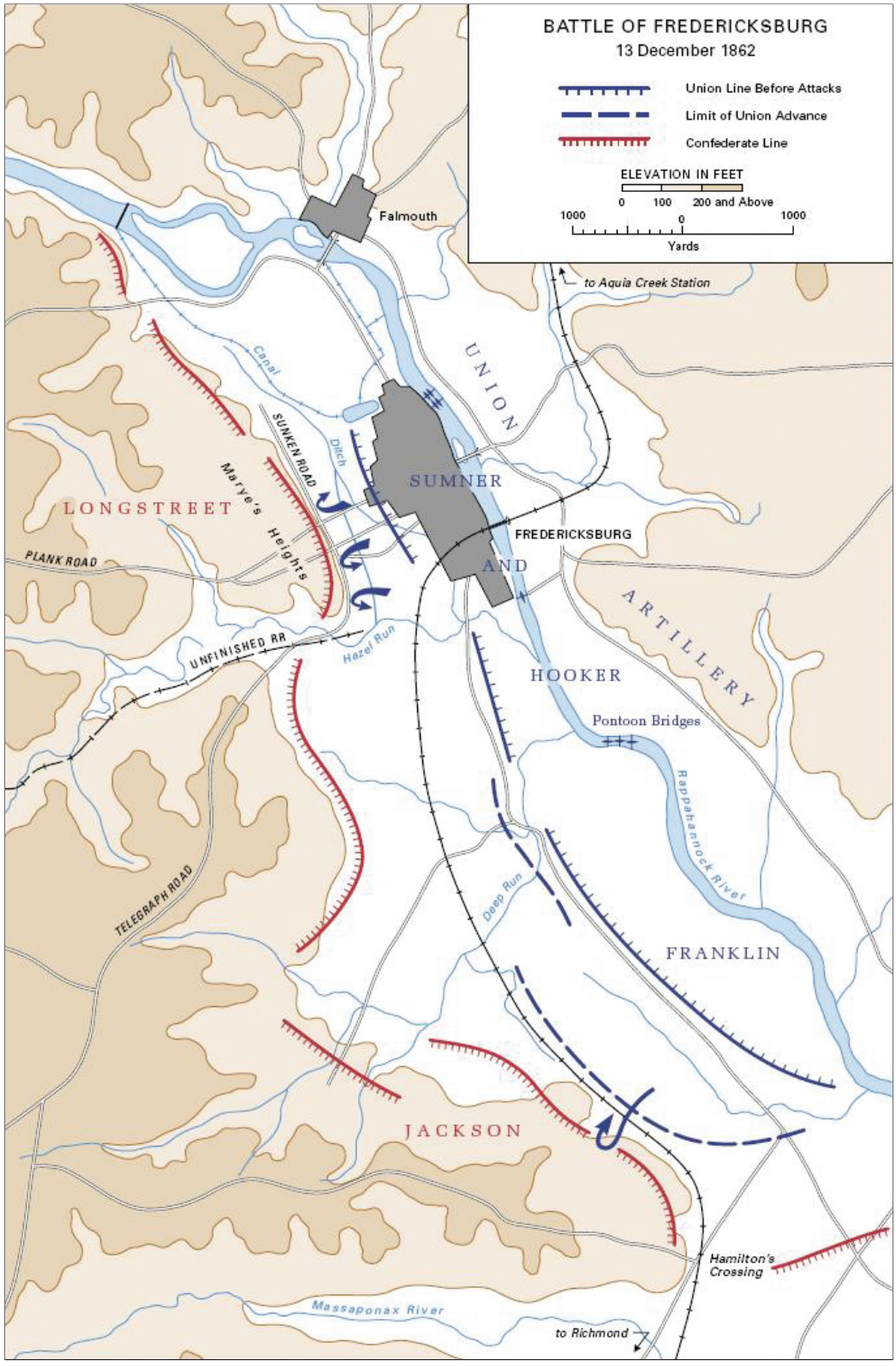


Figure 3.1 The Battle of Fredericksburg

Orders then rang out for the final advance. The landscape beyond the canal ditch contained a few buildings and fences, but from the military perspective it provided virtually no protection. Dozens of Southern cannon immediately reopened on the easy targets and when the Federals traversed about half the remaining distance, [a] sheet of flame spewed forth from the Sunken Road. This rifle fire decimated the Northerners. Survivors found refuge behind a small swale in the ground or retreated back to the canal ditch valley.

Quickly a new Federal brigade burst toward Marye's Heights and the "terrible stone wall," then another, and another, until three entire divisions had hurled themselves at the Confederate bastion. In one hour, the Army of the Potomac lost nearly 3,000 men; but the madness continued.

Although [Confederate BG Thomas R. R.] Cobb suffered a mortal wound early in the action, the Southern line remained firm. Kershaw's Brigade joined North Carolinians in reinforcing Cobb's men in the Sunken Road. The Confederates stood four ranks deep, maintaining a ceaseless musketry while the gray artillerists fired over their heads.

More Union units tested the impossible. "We came forward as though breasting a storm of rain and sleet, our faces and bodies being only half-turned to the storm, our shoulders shrugged," remembered one Federal. "Everybody from the smallest drummer boy on up seemed to be shouting to the full extent of his capacity," recalled another. But each blue wave crested short of the goal. Not a single Union Soldier laid his hand on the stone wall.

Lee, from his lofty perch on Telegraph Hill, watched Longstreet's almost casual destruction of [Union commander Ambrose E.] Burnside's divisions. . . . Turning toward Longstreet, Lee confessed, "It is well that war is so terrible. We should grow too fond of it."

Burnside ordered Maj. Gen. Joseph Hooker's Center Grand Division to join the attack in the afternoon, and late in the day, troops from the Fifth Corps moved forward. Brig. Gen. Andrew A. Humphreys led his division through the human debris of the previous assaults. Some of Humphreys' Soldiers shook off well-meaning hands that clutched at them to prevent their advance. Part of one brigade sustained its momentum until it drew within 25 yards of the stone wall. There, it too melted away.

The final Union effort began after sunset. Colonel Rush C. Hawkins' brigade, the fifteenth such Federal unit to charge the Sunken Road that day, enjoyed no more success than its predecessors. Darkness shrouded the battlefield and at last the guns fell silent.

The hideous cries of the wounded, "weird, unearthly, terrible to hear and bear," echoed through the night. Burnside wrote orders to renew the assaults on December 14, wishing to lead them personally, but his subordinates dissuaded him from this suicidal scheme. On the evening of December 15–16, Burnside skillfully withdrew his Army to Stafford Heights [north of the Rappahannock River], dismantling his bridges behind him. The Fredericksburg Campaign had ended. . . .

Grim arithmetic tells only a part of the Fredericksburg story. Lee suffered 5,300 casualties but inflicted more than twice that many losses on his opponent. Of the 12,600 Federal Soldiers killed, wounded, or missing, almost two-thirds fell in front of the stone wall.

National Park Service

Terrain Analysis

The success of any military operation depends on how well you, as the leader on the ground, have studied the terrain and planned for how weather and light will affect your Soldiers and the enemy. You must be skillful in evaluating these effects on your own Soldiers' ability to perform, but you must also analyze how the terrain, weather, and light will affect enemy troops, weapons, and tactics.

Terrain analysis is a key element of the *reconnaissance* step in the Army's troop leading procedures (TLP) that you will learn about in Section 6. It's also an essential element of the Intelligence Preparation of the Battlefield (IPB) process. IPB is a systematic and continuous process of analyzing the enemy and the environment in a specific geographical area. IPB includes four steps:

- Define the battlefield environment
- Describe the battlefield's effects
- Evaluate the threat
- Determine threat courses of action (COA).

(You'll study the IPB process in depth after you receive your officer's commission.)

Sounds like a full-time job, right? In fact, it is. At the battalion headquarters level, the battalion S-2 (intelligence officer) is a primary staff officer who conducts terrain analysis during the IPB process to support the battalion commander with updated reports for use at both the tactical and strategic levels of operation. As a platoon leader, however, you will hold a tactical advantage over your enemy if you understand how terrain, weather, and light affect your unit's and the enemy's operations.

Terrain analysis can be very important even after a battle is over because combat action can significantly alter the terrain, requiring an update of the previous terrain analysis. Remember that the terrain is constantly changing.

OAKOC

As you have already learned, Army leaders, planners, strategists, and analysts use the acronym OAKOC to stand for the key aspects of terrain analysis: ***O**bservation and fields of fire*, ***A**venues of approach*, ***K**ey and decisive terrain*, ***O**bstacles*, ***C**over and concealment*. This acronym helps you remember what to look for as you perform reconnaissance to prepare for your mission.

OAKOC is an acronym to help you remember the aspects of terrain analysis:
***O**bservation and fields of fire*
***A**venues of approach*
***K**ey and decisive terrain*
***O**bstacles*
***C**over and concealment.*

Observation and Fields of Fire

"O" stands for **observation** and **fields of fire**. Observation can be direct or indirect, aided or unaided. An *unaided* direct observation is how far you can see from your position with your naked eye. An *aided* direct observation is looking from the same position with the aid of binoculars, infrared, night-vision devices, or thermal imaging devices. An *unaided indirect observation* from your position might be a report from a *listening post* (LP) or *observation post* (OP) you have placed forward of your own position, or reports from a *forward observer* (FO).

observation

ability of a force to exercise surveillance over a given area through the use of personnel or sensors

Fields of fire are the maximum effective range of your weapon systems linked to your ability to observe. Sometimes you can see beyond your fields of fire; at other times—such as when you employ indirect fire or combined arms support (CAS)—your fields of fire extend beyond your sight. Many weapons systems' maximum effective ranges extend kilometers beyond your sight.

As a platoon leader, you must extend your sight by deploying LPs, OPs, or an FO forward of your position so you can effectively use these extended fields of fire from your direct and indirect fire-support assets.

fields of fire

the areas that a weapon or a group of weapons may cover effectively with fire from a given position

Figure 3.2 Good Observation and Fields of Fire

Figure 3.3 Platoon Avenue of Approach

Figure 3.4 Company Avenue of Approach

Figure 3.5 Brigade Avenue of Approach

Avenues of Approach

When you analyze terrain for **avenues of approach**, you must consider how both you and the enemy will use the avenues of approach. The attacker looks for avenues of approach that afford the best cover and concealment from enemy observations and fields of fire. The defender will attempt to identify the most likely enemy avenues of approach through **line-of-sight** (**LOS**) analysis and emplace obstacles on them. In addition, the defender should seek avenues of approach that will allow the defender to counterattack the attacking force.

Keep in mind that an avenue of approach is an approach route large enough for a given unit to fire and maneuver through. Therefore, the avenue of approach for an infantry squad needs to be only wide enough to allow two fire teams to fire and maneuver through. Obviously, a brigade combat team consisting of three or more battalions will require a much larger route or avenue of approach.

avenue of approach

route by which a force may reach an objective

line-of-sight (LOS)

the unobstructed path, or intervisibility, from a Soldier, weapon, weapon sight, electronic-sending and -receiving antennas, or piece of reconnaissance equipment to another point

Critical Thinking

Consider the scale of Figure 3.3. How many avenues of approach to the platoon defense can you identify in the figure? What size maneuver unit do you think could maneuver along each avenue of approach? Combining the avenues of approach, what size element do you think this platoon can expect to defend against?

Key and Decisive Terrain

key terrain

any area whose seizure or control affords a marked advantage to either side

Key terrain is any feature that offers the force that controls it a marked advantage. Attackers generally select key terrain as an objective they must attack. Defenders generally select key terrain as the best place to defend. Key terrain is not always the obvious hilltop, bridge, or intersection. You must analyze the terrain and consider how the terrain will benefit both you and the enemy.

Decisive terrain is the sole key terrain that is critical to success of the mission. If you fail to seize or secure the decisive terrain in your area of operation, chances are you will lose the battle or fail to accomplish the mission that higher command gave you. While there may be several key terrain features in your area of operation, not every mission will have decisive terrain. If there is decisive terrain, only one piece of decisive terrain will be critical to mission success. Therefore you should focus your efforts on seizing or securing your decisive terrain.

You can control key and decisive terrain by either seizing or securing them. *Seizing* key or decisive terrain requires attacking it and defending it with troops on the ground. *Securing* requires only that you use or array your forces in a manner that denies the enemy the opportunity to seize or secure the terrain—that is, you prevent the enemy from using or destroying the key or decisive terrain. You can secure terrain by using direct or indirect fire, or by using natural or man-made obstacles to deny the enemy the use of the terrain. The benefit of securing terrain over seizing terrain is that securing terrain does not require sending troops to attack or defend the terrain in order to deny its use to the enemy. A simple example of securing key terrain would be delivering artillery or scatterable mines on the enemy side of a key bridge. You have prevented the enemy's use of the bridge without having to risk Soldiers' lives attacking or defending it.

Figure 3.6 Key or Decisive Terrain?

Critical Thinking

Examine the photo in Figure 3.6. Which (if any) terrain in the photo should you consider key terrain, and which (if any) should you consider decisive terrain?

Obstacles

obstacle

any object that stops, delays, or diverts movement

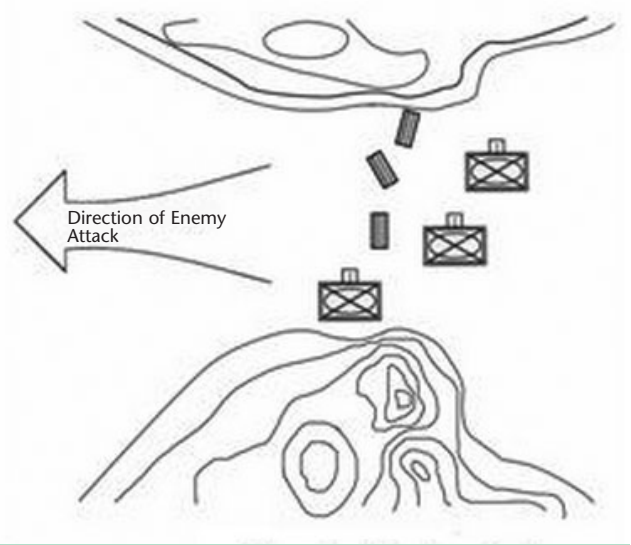
An **obstacle** is a natural or man-made terrain feature. Examples of natural obstacles might be a mountain or swamp or a gorge. A man-made obstacle might be a tank ditch or a line of "Jersey" barriers along a roadway.

There are two kinds of obstacles: *existing* and *reinforcing*. *Existing* obstacles are natural obstacles or obstacles that are considered permanent. Such obstacles include buildings, rivers, creeks, walls, fence lines, depressions, and so on.

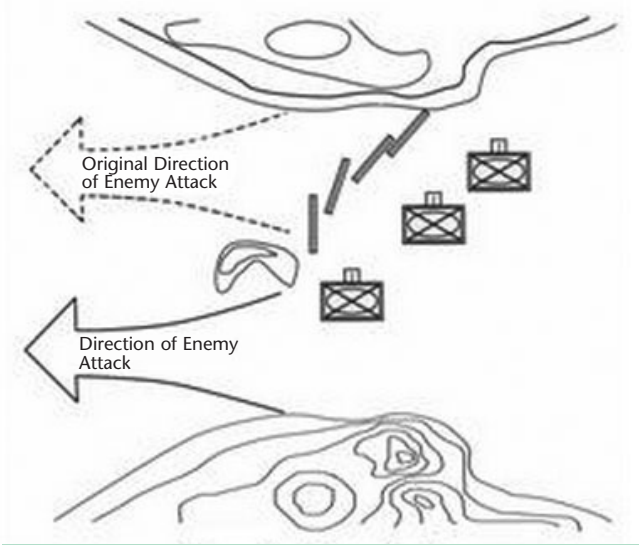
Reinforcing obstacles are usually not natural and not permanent. Minefields or wire obstacles can be reinforcing obstacles. So can building rubble, downed trees, tank ditches, or shell craters in roads, all of which can eventually be moved or removed or repaired.

When you consider emplacing an obstacle, you must first determine what effect you want the obstacle to have on your enemy. Obstacles have four tactical purposes. They can:

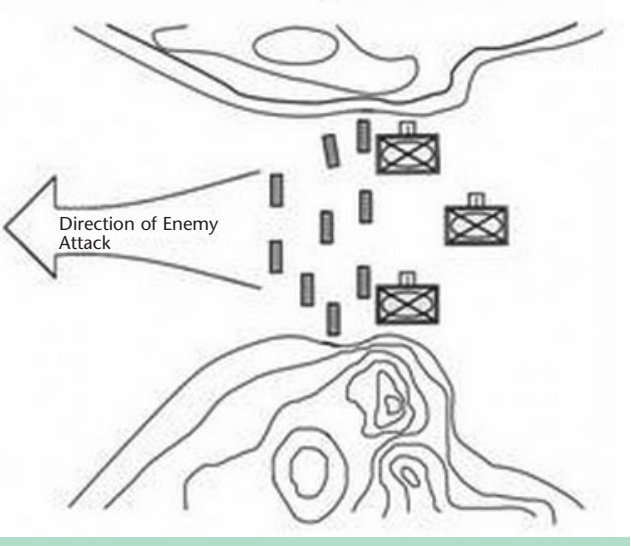
- *Disrupt*—or upset your enemy's formation, tempo, and/or timetable, and force a premature or piecemeal attack. An example of an existing obstacle that disrupts would be a stream or hedgerow, while an example of a reinforcing obstacle might be a single-row minefield.
- *Fix*—or prevent your enemy from moving any part of his force from a particular location for a particular period. A fordable river would be an existing obstacle that fixes. A combination of wire and mine obstacles placed in depth would be an example of a reinforcing obstacle.
- *Turn*—or force your enemy from one avenue of approach or route onto an avenue of approach or route that benefits the defender. An existing obstacle that turns would be a steep slope of a hill or an urban area, while a reinforcing example might be building rubble or a shell crater in a roadway.
- *Block*—or deny the enemy access to an area or prevent advance along a direction or avenue of approach. An existing obstacle that blocks would be a ravine, cliff, or wide river, while a reinforcing example might be in-depth obstacles tied to existing terrain.



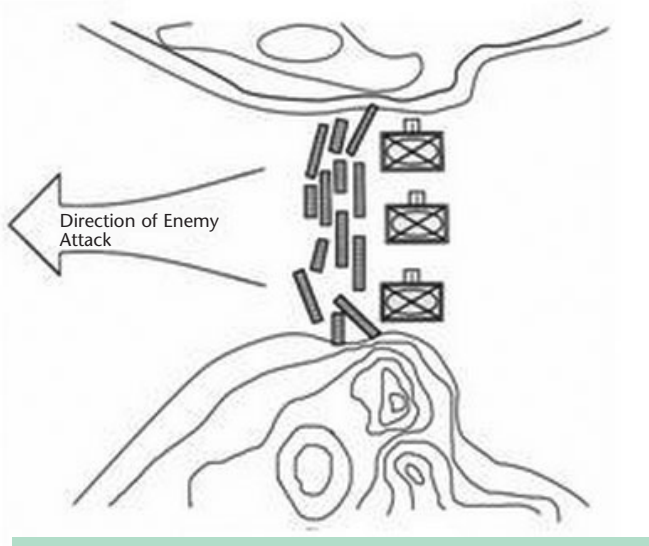
OBSTACLE EFFECT—DISRUPT



OBSTACLE EFFECT—TURN



OBSTACLE EFFECT—FIX



OBSTACLE EFFECT—BLOCK

Figure 3.7 Terrain Presenting Obstacles

Critical Thinking

In Figure 3.7, assume that the enemy will move along the routes depicted by the arrows in order to take advantage of the masking terrain. Which type of obstacle (disrupt, fix, turn, or block) would you consider employing forward of your platoon's defense? Where would you emplace the obstacle(s), and why?

Cover and Concealment

Cover and **concealment** is an aspect of terrain analysis that significantly affects how you move and deploy your Soldiers. It is not sufficient to consider how the terrain will afford you cover and concealment. You must also consider how the same terrain will afford cover and concealment to the enemy. So always think of cover and concealment from both the offensive and defensive viewpoints. Think of how your enemy will cover and conceal, as well as how you will.

The major difference between cover and concealment is that cover can provide concealment, but *concealment does not provide cover*. For example, camouflaged netting over a field artillery piece provides excellent concealment from enemy detection from above, but it provides little or no protection from enemy fire. Generally, concealment alone will not afford you protection from direct or indirect fire, while cover will afford you a degree of protection from the effects of direct or indirect fire. A simple example of cover would be a Soldier hiding behind a tree to avoid small-arms fire.

cover

protection from enemy direct and indirect weapons fire

concealment

protection from enemy observation

Critical Thinking

What kinds of cover might also offer concealment?

Figure 3.8 Good Cover

The relationship between *observation and fields of fire* and *cover and concealment* is an important aspect of terrain analysis. Your observations affect the enemy's ability to move undetected, and the enemy must select terrain that affords concealment along his or her route to prevent your observations. Your fields of fire affect enemy forces' ability to maintain cover while they move along their route. When on the offense, you should select routes that provide cover and concealment to neutralize the enemy's ability to observe or fire on your unit. When you are on the defense, you should select the ground you will defend based on the amount of observation and fields of fire the terrain offers along the covered and concealed avenues of approach that you believe the enemy is most likely to use. In selecting ground this way, you take away your enemy's initiative and ability to execute an attack according to plan.

Line-of-Sight (LOS) Analysis

As a platoon leader, you will use line-of-sight (LOS)analysis to determine the observation, fields of fire, and cover and concealment that the terrain provides both you and the enemy. In other words, the line-of-sight analysis will allow you to use a map to determine the observation, fields of fire, and cover and concealment the terrain affords both you and your enemy.

You will use your knowledge of contour lines, elevation, and slope from your map-reading lessons to conduct LOS analysis of the terrain in your area of operations. Consider the illustration in Figure 3.10. The masked area all lies behind terrain that is level with or higher than your defensive position. You can't see into the masked area or fire direct weapons into it. You do not have observation or fields of fire behind the masking terrain. The masked area provides the attacker cover from the defender's direct fire and concealment from the defender's observations. If the enemy has done proper terrain analysis, then the enemy would select one or more of the approach routes depicted by the red arrows illustrated in Figure 3.10.

Figure 3.9 Good Concealment, No Cover

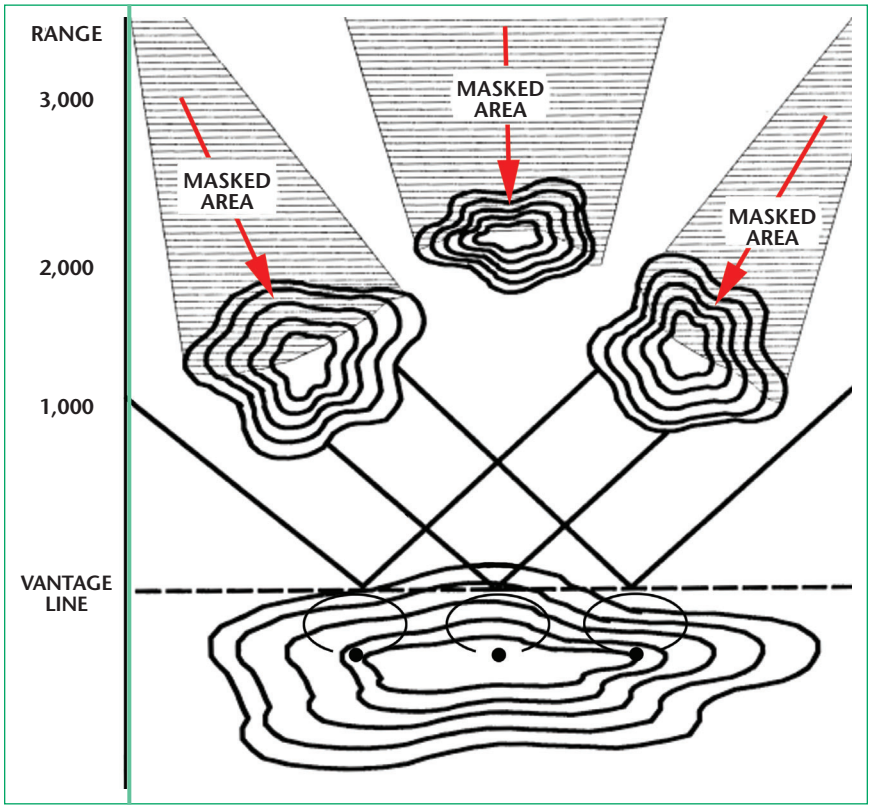


Figure 3.10 Platoon Defense LOS Analysis
The red arrows depict covered and concealed approach routes to the platoon's defense.

Critical Thinking

Where in Figure 3.10 would you put an LP, OP, or FO to support your platoon's defense?

LOS analysis of the terrain is more difficult if you are on the offensive, especially if you don't know where the enemy is. In the offense, you must conduct an LOS analysis to determine the route that will give you the best cover and concealment to your objective while denying the enemy observation and fields of fire on your movement.

Terrain Classifications

Terrain falls into one of three classifications: *unrestricted, restricted,* and *severely restricted.* These classifications refer primarily to how quickly you can cross (traverse) the terrain but also refer to how easy or hard it is for you to shoot, move, and communicate on the battlefield while operating in those terrain conditions. Regardless of the terrain classification, you must always consider how the terrain benefits the enemy.

Unrestricted terrain allows you to move quickly without any disruption to speed or tempo. Unrestricted terrain does not hinder your ability to shoot, move, or communicate, and the terrain itself should not have any adverse impact on your mission, troops, or equipment. An example of unrestricted terrain may be open farmland or a large open field. Although unrestricted terrain may offer you speed, unrestricted terrain may also afford the same speed to the enemy, as well as excellent observation and fields of fire onto your operations.

restricted terrain

terrain that hinders movement to some degree

Restricted terrain hinders your maneuver to some degree. Whether terrain restricts vehicles will largely depend on whether your vehicles are wheeled or tracked. Tracked vehicles such as the Abrams tank and the Bradley fighting vehicle can traverse restricted terrain more easily than wheeled vehicles such as HMMWVs (humvees) or cargo trucks.

What is restricted terrain for vehicles is usually unrestricted terrain for light or dismounted infantry Soldiers. Restricted terrain for vehicles may be roads or highways, or rolling hills that include trees or outcroppings of rocks. Remember that terrain is restrictive if it constrains a unit's options for movement. Jersey barriers or high embankments alongside a road, for instance, can turn it into restrictive terrain—a channelizing obstacle that benefits the defense, not offense. Restricted terrain for forces on foot would include swamps, dense vegetation, steep rugged terrain, and dense urban areas.

Severely restricted terrain includes minefields, unfordable rivers, road or railroad embankments, hedgerows, and extremely dense urban areas. Generally, light infantry forces can traverse the most severely restricted terrain given the time or special equipment.

Figure 3.11 Unrestricted Terrain

Figure 3.12 Restricted Terrain

Figure 3.13 Severely Restricted Terrain

Critical Thinking

Reflect on the concept of avenues of approach and review the photos showing different types of terrain. Think about how an enemy could use each type of terrain as an avenue of approach. What forces would you need to defend each type of terrain?

In maneuvering to fend off numerically superior Union forces in 1864, Confederate GEN Robert E. Lee made good use of the tangled and dense vegetation of the terrain west of Fredericksburg, Va.

"The Green Hell of the Wilderness"

[Union GEN Ulysses S.] Grant also reorganized his forces, consolidating the Army into three corps led by Maj. Gens. Gouverneur K. Warren, John Sedgwick, and Winfield S. Hancock. Ambrose Burnside's independent Ninth Corps raised the total Union complement to 120,000 men.

The Bluecoats negotiated the Rapidan River [in central Virginia] on May 4. Lee easily spotted the Federal advance from his signal stations. He immediately ordered his forces to march east and strike their opponents in the familiar and foreboding Wilderness, where Grant's legions would be neutralized by the inhospitable terrain. [LTG Richard S.] Ewell moved via the Orange Turnpike and [LTG A. P.] Hill utilized the parallel Orange Plank Road to the south. [LTG James] Longstreet's corps faced a longer trek than did its comrades, so Lee advised Ewell and Hill to avoid a general engagement until "Old Pete" could join them.

Grant, although anxious to confront Lee at the earliest good opportunity, preferred not to fight in the green hell of the Wilderness. On the morning of May 5, he directed his columns to push southeast through the tangled jungle and into open ground. Word arrived, however, that an unidentified body of Confederates approaching from the west on the Turnpike threatened the security of his advance. Warren dispatched a division to investigate the report.

The Confederates, of course, proved to be Ewell's entire corps. About noon, Warren's lead regiments discovered Ewell's position on the west edge of a clearing called Saunders Field and received an ungracious greeting. "The very moment we appeared," testified an officer in the 140th New York, "[they] gave us a volley at long range, but evidently with very deliberate aim, and with serious effect." The Battle of the Wilderness was on.

Warren hustled additional troops toward Saunders Field from his headquarters at the Lacy House. The Unionists attacked on a front more than a mile wide, overlapping both ends of the clearing. The fighting ebbed and flowed, often dissolving into isolated combat between small units confused by the bewildering forest, "bushwhacking on a grand scale," one participant called it. By nightfall a deadly stalemate settled over the Turnpike.

National Park Service

The Effects of Weather and Light

Weather and light can have dramatic effects on your assessment of the terrain. As a leader, you must carefully consider the effects of weather and light on each element of OAKOC and must consider these effects from both your perspective and your enemy's. In addition to OAKOC, you must consider the effects of weather and light on friendly and enemy weapon systems, as well as troop health, morale, and performance. The military aspects of weather are:

- visibility
- winds
- precipitation (rain, snow, sleet, hail)
- cloud cover
- temperature and humidity.

How will these factors affect friendly and enemy vehicles, weapons, electronic systems, and other equipment? In both World Wars, trench foot became a major problem for Army leaders, because Soldiers could not keep their feet dry and clean. Equipment that functions just fine in temperate North America may easily malfunction in a Southeast Asian jungle or the Iraqi desert. Your binoculars and gun sights can fog up during a rainstorm, and heavy rain can interfere with radio, radar, and satellite equipment. The signal from your smoke grenades, flares, or illumination rounds may disappear in low cloud cover. If you are downwind from your enemy, you may suffer from blowing dust, smoke, sand, and precipitation, while your enemy suffers from them little, if at all.

Light data is also a crucial part of your analysis. You must know how much light you will have, from what source, and for how long. This implies knowing when the sun and moon rise and set, the moon's phases, the amount of predicted cloud cover, and so on.

Because light and weather data vary so widely from place to place, climate to climate, and season to season, you must constantly keep abreast of the terrain and light data given out by your battalion S-2 and analyze its effects on your specific mission. Doing so will increase the chances of a successful mission, but more important, being prepared decreases the chances of casualties.

The March 2003 sandstorms in Iraq are a recent well-known example of the effects of weather and light on military operations. Julian E. Barnes, a *US News and World Report* senior editor embedded with the Army's 101st Airborne Division, filed the following report.

Many factors both natural and man-made can influence a mission.

US Troops Forced to Cope With What Mother Nature Sends Their Way

(Posted: Mar. 25, 2003) AREA OF OPERATIONS RAKKASANS, IRAQ—The dust storm took only seconds to whip into a fury. The dust-laden air had bathed the new operating base of the 101st Airborne Division in an eerie orange light. A moment later, all the light was gone. The sand obscured the ground at Soldiers' feet. Trucks 10 feet away disappeared into the swirling dust. Then came the lightning, a thunderstorm in the desert. Within moments, it was raining mud.

Inside the Tactical Operations Center, the wind and sand shook the sides of the tent, the rain pattered on the roof, and the generator died, killing the lights and the computers tied to the radar systems. Only the red screens of the top-secret intelligence computers bathed the room in light. "I've never seen anything like this," one of the division's battle captains said into the phone. The freakish weather has forced the Third Brigade to alter its attack plans. "We are waiting for the weather to clear so we can continue our attack to the north," said COL Michael Linnington, the commander of the Third Brigade. "When the 101st cannot fly, we cannot move troops, we cannot move supplies, and we cannot use our attack helicopters."

War planners craft timelines, but missions in the Iraqi spring, which is plagued by fierce dust storms, are subject to the whim of Mother Nature. Planners have learned that they must frequently adjust their timing. Linnington called the delays a "tactical pause," but he said the fight would quickly resume. "When the weather clears you will see a move to the north," he said.

Dust storms over the past two days have forced helicopters flying to the 101st's new base to turn around and head back. One Black Hawk helicopter flying to the base was unable to land because the dust obscured the ground. It turned around to head to another location but ran out of fuel, forcing Soldiers from the Third Brigade to leave the convoy they were defending and find the chopper. "Just trying to find a helicopter in the dark is a problem," said LT Phillip Varner, who led the team that secured the craft.

The 101st has moved about 60 percent of its combat power forward into Iraq, Linnington said. That means all the division is waiting for is a break in the dust storms. The weather is expected to continue to be bad through Wednesday, and Soldiers of the 101st are using the time to build up their camp and its defenses. Though well defended, the base, known as Area of Rakkasans, is very primitive, bare of everything but the most vital necessities. And even some of those are missing. Like shelter. Most Soldiers here are sleeping in the open, digging pits at the foot of earthen berms and setting up their cots in the foxholes. "This is the worst place I have ever been in my life," said SGT Michael Muñoz, a recent arrival. "There is no place to sleep. I cannot breathe out here. I feel sick the entire time. You cannot stay clean no matter what you do. You are constantly dirty."

US News and World Report

CONCLUSION

Knowledge of the battlefield terrain is extremely important during all phases and levels of military planning and operations, making terrain analysis an integral part of your skill and competence as a leader.

Successful leaders know how to evaluate the effects of terrain, weather, and light not only on their own Soldiers, but on how the enemy fights. The success of your mission is closely linked to your careful terrain analysis and the detail with which you conduct the reconnaissance phase of the troop leading procedures.

Key Words

terrain analysis
observation
fields of fire
avenue of approach
line-of-sight
key terrain
obstacle
cover
concealment
restricted terrain

Learning Assessment

1. Explain the purpose of terrain analysis for military operations.
2. List and define the elements of OAKOC.
3. What are two types of obstacles?
4. What are the four effects that you intend an obstacle to achieve?
5. What are the three terrain classifications?
6. Describe some of the effects of weather and light on OAKOC, Soldiers, vehicles, and equipment.

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