

## APPENDIX C

**GEOGRAPHIC ENVIRONMENTS**

*Combat-arms field manuals describe conditions encountered and techniques of operating in jungles, deserts, mountains, cold weather and urban areas. Teams operating in these areas are greatly affected by adverse weather and terrain conditions. Extremes in temperature, humidity, and elevation also have considerable effect on the lift capability of transporting aircraft.*

**C-1. JUNGLE OPERATIONS**

Operations in dense jungle increase the importance of LRS teams because of restricted ground and air observation, including electronic surveillance systems. Human intelligence sources can become the primary source of battlefield information in this terrain. Jungle environments are frequently characterized by dismounted operations, which offers less signature for technical collection efforts. Reconnaissance may be necessary to find the surveillance target, because detailed intelligence may not be available for preparing the mission folder (and because of the fleeting nature of the targets). The nature of these operations places a premium on LRS dismounted skills, particularly stealth, navigation, and break contact drills. Other considerations are infiltration, exfiltration, and communication. (See FM 90-5 for more information on jungle operations.)

a. **Infiltration.** Distance of penetration behind enemy lines may be shorter than for more open terrain. Dismounted, helicopter, and small boat movements are well suited for jungle terrain. All require careful planning and training. Techniques such as rappelling or FRIES may be necessary because of limited available LZs. Careful coordination with adjacent or friendly forward units is necessary for foot or boat movements to prevent fratricide.

b. **Exfiltration.** Teams may be recovered by all available means, but communication and coordination is key due to the rapidly changing nature of jungle operations. Dismounted exfiltration routes must be coordinated immediately before the teams move along them. Linkup operations with friendly forces require careful and deliberate coordination to the lowest element possible (battalion, company). The SPIES is ideally suited for picking up a team from dense vegetation.

c. **Communication.** Dense vegetation, high humidity, and frequent rainfall make HF communication difficult. The vegetation affects radio range and makes antenna erection more difficult. Radio components experience higher failure rates in wet environments.

## C-2. DESERT OPERATIONS

Effective operations in deserts require personal responsibility. To survive in the desert, LRS teams must approach each task in a systematic manner so that it becomes a habit. Weather and terrain are the primary enemies in any military operation, this threat is greatly increased in the desert (FM 90-3). The basic elements of a desert environment are—

- Intense sunlight and heat. These can quickly dehydrate the body.
- Sparse vegetation. Little or no shade can be found and no vegetation to hold the soil down in the wind.
- Mirages obscure terrain and confuse navigation.
- Sandstorm and dust storm. Strong winds usually sweep the areas from northeast to southwest. A searing sandstorm comes from the east or southeast, which impedes visibility and destroys vegetation.
- Light levels are extreme. Bright sunlight can blind soldiers temporarily, and it is often conversely as dark during night hours.
- High-mineral content deposits near the ground surface. These affect radio waves, creating dead spots for radio transmission.
- Wide temperature range. Variations of temperature between day and night can exceed 50 degrees Fahrenheit.
- Low rain fall. This lack of rain leaves few natural water sources and causes dust hazards.

a. **Individual Soldier Responsibilities.** The body requires a given amount of water for a certain level of activity, at a certain temperature. The normal body temperature is 98.6 degrees Fahrenheit. Excess sweating reduces body water content; therefore, water discipline must be enforced in an arid environment to maintain the body's fluid level.

(1) During the hottest periods of the day, soldiers should remain quiet and stay out of the sun. Excess movement causes water loss through sweating. The first measure is to get out of the sun. Soldiers should not sit directly on desert sand or rocks. The ground is 20 degrees hotter than the air. Soldiers should sit under man-made shade, if necessary.

(2) Soldiers must drink water at regular intervals to help remain cool and keep sweating reduced. Even if water supplies are low, soldiers can constantly sip water.

(a) Thirst is not a reliable guide for the body's need for water. Thirst only accommodates two-thirds of the daily requirement. Soldiers should drink at least one-half a quart of water every hour. If the temperature is over 100 degrees Fahrenheit, soldiers should drink one quart of water every hour. They should drink a quart of water with each meal. If there is not enough water, soldiers should not eat.

(b) Water can be flavored with a small amount of a thirst-quencher drink or beverage mix (such as Gatorade or Kool-Aid) to break the monotony. Soldiers should not drink this exclusively, because too much sugar can cause dehydration.

(c) Water in canteens must be changed every 24 hours. Water will go bad if the temperature exceeds 96 degrees Fahrenheit for 72 hours.

(d) Soldiers must avoid alcohol, tobacco products, and caffeine. These substances cause dehydration.

(e) Soldiers should check their urine. A lack of the need to urinate and dark-colored urine are signs of dehydration.

(f) Soldiers should use extra salt in meals, ready-to-eat, but they should not eat salt straight unless an aidman or doctor prescribes additional salt.

(3) Soldiers need at least 6 hours of sleep each day.

(4) Soldiers should be careful around equipment.

(a) Gloves should be accessible to pick up hot items.

(b) Boots and sleeping bags need to be checked for snakes, scorpions, spiders, or other creatures before using the items.

(c) Weapons should not be oiled until needed for combat. Oil attracts sand, which causes jams. To fight rust and sand, weapons must be cleaned daily.

(5) The minimum desert uniform is the desert battle dress uniform with sleeves down, floppy hat, sunglasses, and a scarf. All clothing should be worn loosely. Socks should be changed when they become wet or at least daily. Soldiers should use the buddy system to supervise each other to avoid desert-related injuries.

**b. Operational Considerations.** Leaders must consider the following in planning desert LRS operations.

(1) *Planning.*

(a) Teams cannot stay in position for more than 5 days unless there are caches of water established.

(b) Soldiers must drink 2 quarts of water an hour for 24 hours before insertion.

(c) Soldiers must carry 11 quarts of water (three 2-quart canteens and one 5-quart bladder).

(d) Soldiers must drink 7 quarts of water per day when stationary and 11 quarts when moving.

(e) Teams must test all batteries with a battery tester; battery life is reduced one-third in the heat.

(f) Teams must plan or cache an emergency resupply of water and ammunition.

(2) *Insertion.*

(a) Teams should be inserted on a salt marsh or other hard packed area to prevent dust and sand from obscuring the pilot's view.

(b) Teams should be inserted just before dawn.

(c) Teams should be inserted on or within 1 to 2 kilometers of the hide or surveillance site. Being inserted farther away will cause the teams to consume too much water. With the observation in this terrain, teams cannot carry the water required.

(d) Teams should carry extra water and cache it on the LZ.

(3) *Movement.*

(a) Teams movement rates average 1 kilometer per hour during the day and 3 kilometers per hour during night.

(b) Because terrain features are few and maps are not accurate, soldiers should use a global positioning system.

(c) Teams should walk on rocks and shale to aid in counter tracking.

(d) Teams can move faster on wet or dark sand; loose or dune sand demands slower movement.

(4) *Hide or surveillance site.*

(a) Teams should use diamond desert camouflage nets to construct hide or surveillance sites.

(b) Teams should establish hide and surveillance sites together because of unlimited observation.

(c) Teams must conduct surveillance from a point higher than the named area of interest; afternoon heat (1100 to 1600) obscures optics at ground level and vehicles are difficult to identify beyond 4 kilometers.

(d) To identify vehicles at night teams must move closer (within 2 kilometers) to the objective.

(e) Teams can make hasty subsurface hides in sandy soil. Below 6 inches, the ground turns into solid rock. Subsurface hides require shoring because the sides will cave in; subsurface hides are for stay-behind operations only.

### **C-3. MOUNTAIN OPERATIONS**

Irregular mountain topography normally provides good concealment and cover. Observation varies from good to poor depending on trees and scrub growth. Surveillance sites near ridges and peaks may provide broad areas of observation. Aircraft movement of teams is often limited by altitude capability, erratic wind conditions, and lack of landing sites. Communication is generally difficult; relay stations may be needed for communication between the teams and base stations. (See FM 90-6 for more information.)

### **C-4. COLD WEATHER OPERATIONS**

In extreme cold, teams are hampered by the need to maintain body warmth. In deep snows, teams must operate on skis or snowshoes; consideration may also be given to the use of dogsleds and skimobiles. Long-range weather forecasts are important, particularly during the pre-infiltration phase. Deep snow provides concealment for stationary surveillance sites, but increases the difficulty of orientation and concealment of moving teams. Radio communication is seriously affected by magnetic storms, aurora] effects, and ionospheric disturbances. The radio operator must be sure to select the correct frequencies. Trafficability and load-bearing qualities of ice and snow crust are so significant that determining these factors may be a part of the surveillance mission assigned the team. Survival is difficult during extreme winter conditions. The team must establish a warming area to operate for extended periods at maximum efficiency. Northern summer conditions are characterized by long periods of daylight and numerous water obstacles and marshy areas. The teams use boats designed to navigate northern waterways, when aircraft or ground operations are restricted.