Soldier Load: The Art and Science of 'Fighting Light'

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When it comes to Soldier load, the Army has a weight problem... not with Soldiers but with how much they carry. Soldiers in the Army — and particularly those in the Infantry — carry far too much. Many people equate Soldier load with the amount you can carry and the length of the dismounted movement. For example, most Infantry Soldiers think about ruck-marching standards in terms of the Expert Infantry Badge (EIB) standard — carrying a 35-pound ruck for 12 miles in under three hours. As part of Joint Readiness Training Center (JRTC) Rotation 23-09, 2nd Battalion, 30th Infantry Regiment took a different approach to Soldier load, and this article will share some of the lessons we learned.

Understanding Soldier load requires leaders to think differently about dismounted movement. First, leaders need to know what risk is associated with overloading our Soldiers. Second, leaders need to think differently about the various types of loads and how to tailor unit equipment loads. Third, leaders need to consider how to train movement under load for planning purposes. Lastly, "fighting light" requires a disciplined approach to resupply operations. Understanding and executing operations that minimize Soldier load are difficult and take training to conduct successfully. Despite these challenges, units that master this are lighter and more lethal.

The Risk Assumed and Who Owns It

Excessive Soldier load for dismounted infantry poses both a risk to force and a risk to mission. Soldier load is often misunderstood because leaders don't understand who really owns the risk trade-off of overload-ing Soldiers versus not carrying something you need.



Soldiers move to their next objective during a Joint Readiness Training Center rotation at Fort Johnson, LA, on 30 April 2023. (Photo by SPC Luis Garcia)

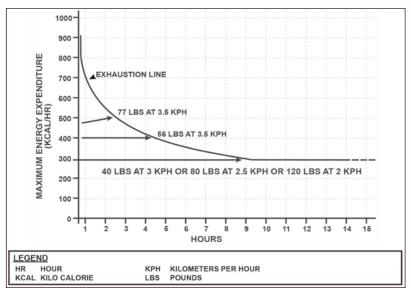


Figure 1 — Maximum Energy Expenditure (ATP 3-21.18, Figure 3-4)

Risk to force is increased by Soldier overload. Fatigue and poor equipment positioning can offset any advantages to carrying everything you might need during a patrol, thereby increasing risk to force. "Heavy loads decrease situational awareness by tilting the head at a downward angle and increasing the amount of weight that has to be controlled when a Soldier stops quickly. In controlled experiments, loads have also been demonstrated to adversely affect shooting response times, increasing the time it takes soldiers to fire accurately by 0.1 second, relative to unloaded conditions."¹In addition to the risk of direct fire contact, the risk of injury, both during the movement and long term, is compounded by Soldier load. "Common injuries associated with prolonged load carriage include foot blisters, stress fractures, back strains, metatarsalgia, rucksack palsy, and knee pain."²

Risk to mission is also increased by overloading Soldiers. An increased load directly impacts the energy Soldiers have available to conduct the mission once the movement is complete. In other words, if Soldiers use all their energy on the approach, they will be fatigued on the objective. "Loads carried on other parts of the body result in higher energy expenditures: each kilogram added to the foot increases energy expenditure 7% to 10%; each kilogram added to the thigh increases energy expenditure 4%."³ Fatigue and its effect on Soldier performance cannot be understated.

The heavier the load, the less energy a Soldier has to complete the mission. Fatigue also has a direct negative impact on a Soldier's ability to engage targets. In Army studies, "the time required to determine and acquire a target increased under heavy loads from just over 3 seconds to more than 3.5 seconds in some configurations, as accuracy decreased."⁴

Soldier load impacts the mission beyond the fatigued Soldier being less able to complete a mission and engage a target quickly and accurately. Increased Soldier load also increases the risk from a slower speed of movement. The speed of movement will decrease because of both terrain and load. The longer a unit is moving, the more it is susceptible to enemy contact, thus increasing the risk to both force and mission.

Soldier load should be managed by all leaders, and NCO involvement at the lowest level is the key element to ensuring our Soldiers remain light and responsive. At lower levels, NCOs are the ones who make the final checks and ultimately have to deal with the consequences of overburdening Soldiers. For commanders and their staffs, properly managing Soldier load can reduce the overall risk to both mission and force.

The senior enlisted member of the unit is responsible for the packing list during each training event, but junior leaders should be empowered to make risk-informed decisions. For company training events, this

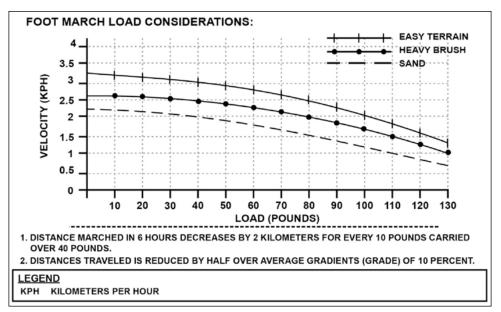


Figure 2 — March Velocity Depletion Based on Load during Cross-Country Movement (ATP 3-21.18, Figure 3-3)

is the first sergeant, and for battalion training events, it is the battalion command sergeant major. Again, leaders at the lowest level should feel empowered to make decisions regarding Soldier load. Team leaders and squad leaders are responsible for conducting pre-combat inspections. If left unchecked, junior Soldiers may take more than required on a training event for fear that they may need the item. If layouts are not conducted at the squad and team levels, Soldiers may inadvertently burden themselves with additional gear, especially in the winter months.

Ultimately, the commander is responsible overall for the risk associated with Soldier load. A commander owns the risks to mission and force from having too heavy a load. This risk is obvious, especially in the summer months, so commanders at all levels must consider Soldier load in their planning. For battalion commanders, the military decision-making process (MDMP) should include Soldier load, and for company commanders, this should occur during the troop leading procedures (TLPs). At the company level, commanders and first sergeants must consider Soldier load when evaluating their own troops as part of METT-TC (mission, enemy, terrain and weather, troops and support available, time available, civil considerations), and Soldier load must be revalidated during pre-combat inspections. Remember, Soldier load INCREASES as orders go down to companies, platoons, and squads. Leaders must remain engaged to ensure unnecessary weight is not added.

During MDMP, Soldier load should be specifically evaluated during Steps 2 and 6; it will be owned by the S-4, who will maintain a running estimate of Soldier load at all times. As part of the S-4's assessment during mission analysis (Step 2), the S-4 will display the current weight with and without water and food (dry weight vs. full weight). As part of course-of-action (COA) approval (Step 6), the battalion S-4 will brief the commander on changes to estimated Soldier load when considering equipment added for that specific COA.

Dictating the steps of MDMP where Soldier load is discussed may seem proscriptive, but this is essential to ensuring leaders remain aware of what we are asking Soldiers to carry. This responsibility does not end with planning — it continues into execution. The staff shares responsibility for Soldier load. The battalion S-4 must remain cognizant of the amount of ammunition and meals a Soldier is carrying during operations. Ammunition, water, and meals are the heaviest items carried by Soldiers, and staff officers must remain aware of what they are asking Soldiers to carry. Water is not negotiable, but food and ammunition are

variables that can be controlled by the battalion S-4. Resupply capabilities, discussed later in this article, are ways to minimize the amount a Soldier is carrying. Hot meals brought forward not only decrease the risk of hot and cold weather injuries but also decrease the amount of food a Soldier is required to carry.

The Individual Soldier's Combat Load

We need to redefine what the term Soldier's load really means. It is often misunderstood, as in the EIB example, to indicate what Soldiers have in their ruck, but what Soldiers are carrying is again far more complicated than just what is on their back. We need to understand everything included in Soldier load and also comprehend what a realistic goal would be. With this in mind, we can redefine what we expect a team, squad, and platoon to carry, as unit equipment quickly adds up across Soldiers.

Soldiers are not only carrying what is in their rucksack, but they also have all of their individual equipment, weapon, position-specific gear, and radios. To just look at what someone is "carrying" does not give a complete picture of the demands we are placing on Soldiers, nor does it help us understand what can be removed to ease Soldier load. In their recent report for the Center for New American Security, Paul Schaffer and Lauren Fish attempted to better define what constitutes Soldier load:

Fighting load consists of the equipment (weapon, ammunition, helmet, body armor, water, etc.) that Soldiers carry directly on their person when maneuvering and fighting.

Approach load consists of the fighting load plus a rucksack carried during a march, which would contain additional water, ammunition, food, and other supplies for the duration of the mission.⁵

Another way to look at the definitions above is to look at the fighting load as everything a Soldier would carry onto an objective from the objective rally point (ORP). The approach load is everything a Soldier would carry to the ORP, which includes the fighting load. This definition not only accounts for all the weight a Soldier carries, but it also puts the items carried in an operational framework.

Tables 1-3 show an example packing list used by 2-30 IN during our August 2023 JRTC rotation and include the fighting load, approach load, and a team bag, which will be discussed later. The packing list is designed to get a Soldier through an entire 10-day summer rotation and has a dry weight of under 25 pounds

ITEM	WORN ON PERSON	QTY
1	Modular Lightweight Field Load Carrier (with pouches)	1 EA
2	Magazines, 30-round	7 EA
3	Individual First Aid Kit (IFAK)	1 EA
4	Advanced Combat Helmet (ACH) with pads and cover	1 EA
5	Gloves, OCIE/RFI	1 PR
6	Ballistic eye protection (APEL approved)	1 EA
7	ID card	1 EA
8	ID tags with chains (long and short)	1 SE
9	Note-taking material	1 SE
10	Flashlight with red color lens	1 EA
11	Hearing protection	1 EA
12	Watch	1 EA
13	M4 Blank Adapter	1 EA
14	Combat uniform (OCP)	1 EA
15	Cap, patrol with rank and name tape	1 EA
16	Assigned weapon	1 EA
17	Night vision	1 EA

Table 1 — Example Fighting Load

ITEM	RUCKSACK DESCRIPTION	QTY
1	Rucksack	1 EA
2	2-quart canteen	1 EA
3	Entrenching tool (E-Tool)	1 EA
4	Socks	4 EA
5	Shirt, brown	1 EA
6	Hygiene kit (72 hours) *Razor, shaving cream, toothbrush, toothpaste	1 SE
7	Bivy cover	1 PR
8	Parka, wet weather w/rank	1 EA
9	Poncho/rain fly	1 PR
10	Poncho liner	1 PR
11	Weapons cleaning kit	1 EA
12	Canteen, 1-quart	2 EA
13	Hydration system (CamelBak)	1 EA
14	Meal, ready to eat (MRE) (field stripped)	6 EA
15	Baby wipes	1 EA
16	Sunblock	1 EA
17	Bug repellent	1 EA

Table 2 — Example Approach Load

ITEM	TEAM BAG	QTY		
1	Army Combat Uniform (top/bottom)			
2	Boots, tan/brown IAW Army Regulation 670-1	1 PR		
3	Socks, boot, black/green	4 PR		
4	Undershirt, tan/brown	4 EA		
5	Personal hygiene kit (1 week)	1 SE		
6	Improved Outer Tactical Vest (IOTV) with plates	1 EA		
7	Protective mask	1 EA		

Table 3 — Example Team Bag

per ruck. Additional combat load, even for medics and those carrying special equipment, did not exceed 55 pounds. Two main factors contributed to the "lightfighter" load. One, this packing list is dependent on access to company trains within 24 hours, and two, this packing list will vary depending on METT-TC requirements, especially weather.

The use of the team bag is essential. Company trains give a unit the flexibility to put items not needed during the approach onto company trains and move them forward when needed.

The one missing variable is the inclusion of equipment for each person by position. The main contributor to remaining weight is ammunition, followed by batteries. This can vary greatly by position; for example, a radio-telephone operator (RTO) might carry little ammunition and a relatively light M4 but may carry multiple batteries. Conversely, a machine gunner may transport few radio batteries but carries the most weight when considering the weight of the ammunition and weapon. Again, this requires leaders to make informed decisions and accept risk. Infantry leaders often consider carrying the entrenching tool (E-tool) as a "must-have." However, if you consider machine gunners, Soldiers who carry an extremely heavy load and are always behind their weapon (and thus never dig their own position), the question turns into whether or not they actually need an E-tool. Figure 3 shows the breakdown of weights by position when merging the above packing list with weights of batteries, weapons, and the other items required for their duty assignment.

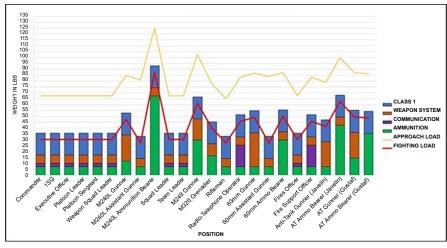


Figure 3 — Analysis of All Weight Carried (including Weapon System) Using 2-30 IN JRTC 23-09 Packing List

Soldier load is often inadvertently increased because of requirements for special equipment at echelon, and leaders must limit the amount of this equipment to reduce the amount of weight individuals are carrying. Special equipment at the team level may be duplicative when operating as a platoon. For example, wire cutters carried by a team for a squad patrol should not result in six wire cutters going out on a platoon-sized patrol. Managing special equipment takes leader involvement, and Soldier load can be reduced by only carrying the minimum equipment required for a mission. As stated previously, junior leaders should feel empowered to make decisions on what is carried. The uniform should fit the requirements of the mission. Tables 4-6 specifically look at special equipment by organizational level and eliminate redundancy at echelon.

Decisions of what not to carry should be made by informed leaders, even at the team leader level. Even in these examples, additional changes can be made. For example, machine gunners may not need to carry E-tools, and their assistant gunners can carry one tool for both of them. Leaders must think intentionally of creative ways to limit weight.

Traditional Special Equipment	Suggested Lightfighter Special Equipment	
Aid and Litter - Skedco - Aid bag - Helicopter landing zone (HLZ) kit -OR- Breach - Shotgun - Wire cutters - Hooligan tool -OR- - Flexcuff - Enemy prisoner of war (EPW) tag kit -OR- Demo - Demolitions - Det cord - M88 & shock tube Additional items: - M249 spare barrels	Aid and Litter - Skedco - Aid bag - HLZ kit -OR- Breach - Shotgun - Bayonet -OR- - Flexcuff - EPW tag kit -OR- Demo - Only when required	

Traditional Special Equipment	Suggested Lightfighter Special Equipment		
Aid and Litter - 2x Skedco - 2x Aid bag - 2x HLZ kit	Aid and Litter - 1x Skedco, 1x Poleless litter - 2x Aid bag - 1x HLZ kit		
Breach - 2x Shotgun - 2x Wire cutters - 2x Hooligan tool	Breach - 1x Wire cutters - 1x Bayonet EPW		
EPW - 2x Flexcuff - 2x EPW tag kit Demo - 2x Demolitions - 2x Det cord - 2x M88 & shock tube	- 2x EPW tag kit Demo - Only when required		
	Other items: - Batteries		
Other items: - Batteries - M249 spare barrels			

Table 5 — Special Equipment for the Infantry Squad

Traditional Special Equipment	Suggested Lightfighter Special Equipment		
Aid and Litter	Aid and Litter		
-6x Skedco	- 2x Skedco, 3x Poleless litters		
-6x Aid bag	- 6x Aid bag		
-6x HLZ kit	- 1x HLZ kit		
Breach	Breach		
-6x Shotgun	- 1x Shotgun		
-6x Wire cutters	- 2x Wire cutters		
-6x Hooligan tool	- 2x Bayonet		
EPW	EPW		
-6x Flexcuff	- 3x Flexcuff		
-6x EPW tag kit	- 3x EPW tag kit		
Demo -6x Demolitions -6x Det cord	Demo - Only when required		
-6x M88 & shock tube Other items: - Batteries - M249 spare barrels - 2x Thermal sights for M240 - 2x Tripod	Other Items: - Batteries -2x Thermal sights for M240 -2x Tripod		

Table 6 — Special Equipment for the Infantry Platoon

Training for Soldier Load

When training for long-distance movement, leaders should not fall into the trap of just carrying heavy loads over extended distances. Instead, training should replicate patrolling rather than preparing for an EIB ruck march. Similarly, at every available opportunity, units should train on dismounted sustainment. Once a unit goes light, one of the hardest challenges will be sustaining the dismounted force.

When training for dismounted movements, leaders should focus on perfecting their movement rates, rates of march, movement formations, and actions at halts. These are essential for a dismounted element away from supply lines.

Controlling the rate of march is vital to ensuring dismounted Soldiers can sustain tempo when attacking an objective. Even with the lightest of loads, an uncontrolled rate of march will fatigue units, making Soldiers

	КРН				
	ON ROADS		CROSS-COUNTRY]
AVERAGE RATES OF MARCH FOR:	DAY	NIGHT	DAY	NIGHT	KM PER DAY
FOOT SOLDIERS	4	3.2	2.4	1.6	20 to 32
LEGEND KM KILOMETER KPH KILOMETERS PER HOUR					

Figure 4 — Average Dismounted Rates of March (ATP 3-21.18, Figure 3-2)

combat ineffective. The rate of march should be controlled by leaders at all levels and determined in accordance with the standards set forth in Army Techniques Publication 3-21.18, *Foot Marches*.

Understanding halt timelines is also essential. For dismounted infantry movements, units will "halt for 15 minutes during the first hour [of movement] and 10 minutes every 50 minutes thereafter."⁶ This pace can be adjusted by leaders at all levels according to mission requirements. Ensuring halts are executed ensures that Soldiers are not only able to close short distances but are also able to close long distances over extended periods of time. During the first hour's long halt, units should check Soldier equipment and adjust or redistribute it as necessary. During this halt, and all following halts, Soldiers will maintain security while consuming water and food. Doing this will help Soldiers maintain energy levels. Leaders will conduct foot checks as required. During halts, the formation will conduct actions normally associated with long halts, to include establishing hasty sectors of fire, performing maps check, repositioning casualty-producing weapons (M240), and conducting a hasty emplacement of mortars.

Halts should be planned whenever possible and exhibit characteristics similar to that of a patrol base (a site that is easily defendable for short periods of time, away from natural lines of drift and high-speed avenues of approach, provides cover and concealment from both ground and air, and provides little to no tactical advantage to the enemy, according to the *Ranger Handbook*, Training Circular 3-21.76). Planning should be associated with a movement control measure, specifically a planned checkpoint, or a phase line.

Movement rates through restrictive terrain should plan for a light infantry company to move at 2 kilometers per hour (kph) during the day and 1 kph at night. Although this is a generally accepted rule, route planning is the largest factor of a steady rate of march. Keeping Soldier load light helps Soldiers cross this distance more efficiently. Achieving 20-32 kilometers per day is only possible when Soldier load and rate of march are combined effectively.

Route planning should avoid moving through restrictive terrain except when the tactical situation requires. Slope, vegetation, and hydrology should all be taken into consideration when planning routes. Current computer modeling shows the impact of terrain on movement speed for a Soldier moving under 40-pound and 140-pound loads. For light infantry to utilize restrictive terrain for tactical advantage, both Soldier load and route planning must be considered.

Figure 5 uses computer models to show the fastest route over specific types of terrain when a 200-pound individual conducts movement over restrictive terrain. The goal for leaders should be to achieve the yellow line. This route combines a lighter Soldier load with a shorter and more tactically advantageous route. The lighter load allows for the dismounted Soldier to better utilize restrictive terrain, thus providing a perceived tactical advantage.

Movement formations and techniques are of special consideration for dismounted movements under load. The wedge and the column remain the fastest formations, with the wedge maintaining the highest level of security. The modified column and the column should only be used when the terrain does not allow for the wedge. Although traveling and traveling overwatch are considered the fastest movement techniques, the bounding overwatch formation gives Soldiers a chance to rest while providing security. Leaders should consider the bounding overwatch technique to maintain security when movement must be maintained but Soldiers are showing signs of fatigue.

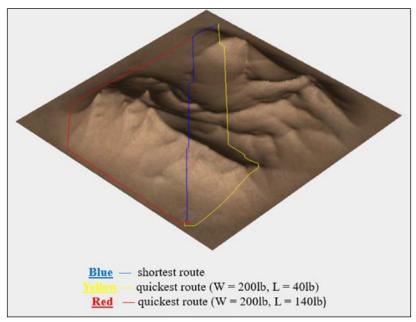


Figure 5 — The Effects of Load on Route Selection⁷

Dismounted Resupply

Dismounted resupply is one of the most difficult aspects of operating as light infantry. It involves the transfer of equipment from a logistical element to the dismounted fighting Soldier. A vehicle cannot simply move right up to a dismounted location. It takes planning, and the transfer from a vehicular or air platform to a dismounted resupply team must be rehearsed. "Fundamentally, only two great novelties have come out of recent warfare. They are: (1) mechanical vehicles, which relieve the Soldier of equipment hitherto carried by him; (2) air supply, which relieves the vehicle of the road."⁸ Resupply is essential to "lightfighting." Without sustained water, food, and ammunition, light infantry units cannot operate for extended periods of time. To remain resupplied, light infantry units should remain innovative, adaptable, and disciplined. There are multiple ways to resupply dismounted infantry units, including the use of company trains, a dismounted duty platoon, speedballs, caches, and aviation elements.

Company trains remain the main method of resupply for company-level and below dismounted movements. As a planning factor, company trains should remain at least one terrain feature away from combat formations and out of direct fire contact. In a light infantry formation, the company trains may only consist of two vehicles: the commander's High Mobility Multipurpose Wheeled Vehicle (HMMWV) and the company Light Medium Tactical Vehicle (LMTV). When operating in restrictive terrain, the company all-terrain vehicle may also be utilized to transport equipment between the location of the LMTV and the company patrol base. The company executive officer (XO) oversees resupply as the first sergeant moves with the formation. This is not a rigid requirement but a planning consideration that leaders can adjust.

Dismounted resupply is the only organic method that can traverse through restrictive terrain. The company patrol base is usually located in restrictive terrain where the LMTV cannot conduct tailgate resupply. Companies should designate a platoon to conduct resupply operations. The first sergeant is responsible for conducting resupply from the trains forward to the company. As previously mentioned, duty platoons with the right equipment can assist with resupply. This will require one platoon to reduce the amount of personal equipment its Soldiers are carrying in order to carry supplies (especially Class I, III, and IV). This allows a dismounted element to move forward without bringing up company trains. The increased load of these classes of supplies, however, fatigues the troops assigned with this duty and may make them combat ineffective for the current operation.

Speedballs are a colloquial term used to describe prepackaged resupply bundles. These supplies are meant to quickly resupply at the point of need and usually consist of Class I, II, III, IV, and V. In contact, Class I and V will be the most emergent needs. These items are packaged in duffle bags or body bags and pre-staged at the brigade support area. During mission planning, the battalion S-4 should coordinate between the companies and the forward support company to configure these items. Also key to using speedballs is the need to track their location

so they can be loaded onto waiting trucks or aircraft. The battalion XO or commander is usually the release authority for sending speedballs forward to troops.

Caches are another form of resupply not commonly used. "Caching is the process of hiding equipment or materials in a secure storage place with the view to future recovery for operational use."⁹ Caches are another way to lighten Soldier load and require prepositioned supplies to be staged forward. The key element of a cache is that the supplies are left hidden and unsecured until the receiving unit secures them. In order to properly cache an item, two elements — the placing unit and the receiving unit — are tasked to conduct the caches. The placing unit could be a scout element, an aviation element dropping supplies, or a vehicle trailer that was placed in the woods. The receiving element is usually larger and unable to resupply internally. The danger with caches is that an enemy element could find the cache and either take the supplies or ambush friendly forces when they come to retrieve the supplies. Key to the cache is properly marking the location, communicating this location to a higher element, camouflaging the equipment, and taking steps (like deception) to ensure enemy forces do not find the location.

Aviation elements have a unique advantage in conducting resupply operations. For a dismounted resupply, there are two main types of resupply conducted by aviation elements. Low-cost, low-altitude (LCLA) resupply involves dropping supplies from a rotary-wing or fixed-wing aircraft. LCLA requires coordination between the battalion and the aviation element. This requires pre-coordination to ensure that the resupply takes place in a timely manner. Units may also require a jumpmaster and pathfinder to assist the aviation element in dropping supplies. There are two main challenges of LCLA. First, while preplanned LCLA drops are an effective way to conduct resupply, LCLA is not especially flexible to the needs of "lightfighters." Second, parachutes do not always land where planned. A resupply package drifting off course can increase the amount of time before the resupply and risk being compromised by the enemy.

Sling loads are resupply packages moved underneath rotary-wing assets. UH-60s and CH-47s can sling various packages across all classes of supply. Sling loads are reliable and can place supplies in an accurate location. The drawbacks of sling loads are the equipment required to sling and the shortage of trained personnel to rig resupply. Again, it takes practice to get crews proficient in rigging resupply bundles. An additional drawback is that rotary-wing assets can give away positions if drop locations are not properly planned.

Finally, water resupply is the most pressing need for a dismounted rifle company, especially during warm weather. There are several ways to conduct water resupply, but all come at a cost. Water purification, if acceptable at a unit's location, can solve this problem, but purifying water takes time, requiring a unit to stop movement. Purification tablets are also an option, but these may not filter out heavy metals and all toxins, and again, are one more item a Soldier must carry. Each rifle company has a 400-gallon water "buffalo" capable of resupplying a rifle company. However, this also needs to be rehearsed. Even for a well-rehearsed company, resupplying callbacks, or water gallons, can take more than an hour.

Conclusion

Soldier load is not a simple problem that can be easily solved or viewed as merely weight and distance. Army leaders must understand the risk in overloading Infantry Soldiers. The asymmetric advantage of light infantry is the ability to move through restrictive terrain to gain a decisive advantage over the enemy. This mobility gives them the ability to capitalize on the principles of the offense, specifically surprise and audacity. Without managing Soldier load, a light infantry formation loses all principles of the offense, and this adversely impacts tempo and increases risk to the force and mission. In short, a lighter force is a more lethal force. We have to rethink how we view Soldier loads and must look at approach and fighting loads in a different light. Managing Soldier load must be done by adhering to the packing list, understanding the compounding impacts of adding weight requirements at echelon, ensuring that rate of march supports Soldier load efforts, and conducting efficient dismounted resupply. This is a leader business, and the success of America's fighting Soldiers depends on maintaining the "lightfighter" mindset.

Notes

¹ Lauren Fish and Paul Scharre, "The Soldier's Heavy Load," Center for a New American Security (En-US), www. cnas.org/publications/reports/the-soldiers-heavy-load-1.

² Joseph J. Knapik, Katy L. Reynolds, and Everett Harman, "Soldier Load Carriage: Historical, Physiological,

Biomechanical, and Medical Aspects," *Military Medicine*, January 2004, https://pubmed.ncbi.nlm.nih. gov/14964502/.

³ Ibid.

⁴ Fish and Scharre, "The Soldier's Heavy Load."

⁵ Ibid.

⁶ Army Techniques Publication 3-21.18, *Foot Marches*, April 2022.

⁷ Jeremiah M. Sasala, "Individual Soldier Loads and The Effects on Combat Performance," (Thesis, Naval Postgraduate School, 2018), https://apps.dtic.mil/sti/pdfs/AD1060058.pdf.

⁸ S.L.A. Marshall, *The Soldier's Load and the Mobility of a Nation* (Quantico, VA: The Marine Corps Association, 1950).

⁹ Training Circular 31-29, Special Forces Caching Techniques (discontinued).

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Soldiers in 2-30 IN move to Peason Ridge training area to conduct situational training exercises at Fort Johnson, LA, in January 2023. (Photo courtesy of 3rd Brigade Combat Team, 10th Mountain Division)